MINISTRY OF CULTURE · GOVERNMENT OF INDIA
AS-002055
CSL
RARE
C.S.L.

SIMLA
HOME DEPT
LIBRARY
103

THE
MAMMALIAN GAME
OF
BRITISH INDIA.

A DESCRIPTIVE ACCOUNT OF ALL THE KNOWN SPECIES OF GAME ANIMALS, WITH OBSERVATIONS ON THEIR HABITS AS WELL AS A COMPILED ACCOUNT OF THE EXPERIENCES, &c., OF INDIAN SPORTSMEN UP TO DATE. WITH WOODCUT ILLUSTRATIONS AND A SYLLABUS OF PRACTICAL TAXIDERMY.

BY

JAMES A. MURRAY, F.S.A.L., F.S.Sc.; &c.,

MEM. OF THE NATURAL HIST. AND ANTHROP. SOCIETIES OF BOMBAY; MANAGER, VICT. NAT. HIST. INSTITUTE; LATE CURATOR, KURRACHEE MUNICIPAL LIBRARY AND MUSEUM; AUTHOR OF "A HAND-BOOK TO THE GEOLOGY, BOTANY AND ZOOLOGY OF SIND;" "THE PLANTS AND DRUGS OF SIND;" "KURRACHEE TO KANDAHAR;" "THE VERTEBRATE ZOOLOGY OF SIND;" "THE REPTILES OF SIND;" "THE AVIFAUNA OF BRITISH INDIA AND ITS DEPENDENCIES;" "THE AVIFAUNA OF CEYLON;" "THE EDIBLE AND GAME BIRDS OF BRITISH INDIA AND CEYLON;" AND PRACTICAL TAXIDERMY.

Bombay:
PRINTED AT THE
EDUCATION SOCIETY'S STEAM PRESS, BYCULLA.

1891.

RARE
799.2(54)
Mur M71.M.

799.2
~~M 9 M~~

CSL

PREFACE.

No apology need be offered for the publication of this work. Although the Author's "Vertebrate Zoology of Sind" contains much of the information which will be found in the present work, and Mr. Sterndale in his Manual has given Statistics which were in much request, yet there is a call for it from sportsmen on the plea that there is so much more recent information of decided interest and value scattered in various Periodicals and Sporting papers, which should be compiled and made into a harmonious whole.

Unlike other more costly illustrated works on Game Mammalia, this work will contain descriptions of every species known in India; their habitat or places where they are found, their habits, and the season during which they breed. This last will supply all the necessary information to Sportsmen in regard to a "close time."

The illustrations are all Lithographs, and sufficiently clear for the identification of the species they are intended to represent, without even the aid of description.

The Author regrets very much the delay in the issue of the work, but this could not be helped, as all the illustrations which were in the first instance sent to England to be executed were lost in transit, and had to be done by the Education Society's Press. These, however, are fairly representative.

RARE

MAMMALIAN GAME

SIMLA
HOME DEPT.
LIBRARY

MUSK DEER

Mōschŭs mōschifĕrŭs

799.25

Division
Acc. No. ART 590
Date of accsn 15.12.73
Cat. No
Processed
Date of Transfer
Checked

20885

VERIFIED

THE
MAMMALIAN GAME
OF
BRITISH INDIA.

ORDER—FERÆ, *Linn.*

Incisors $\frac{6}{6}$, regular, erect; canines $\frac{1-1}{1-1}$, conical; molars $\frac{4-4}{3-3}$, forming a regular continuous series, largest in the middle. Feet clawed. Thumb non-opposable; teats abdominal, 4 or more.

Sub-Order, CARNIVORA.

Grinders of three distinct forms; premolars conical, separated from the hinder tubercular molars by a sharp-edged flesh-tooth bearing a tubercle on its inner side.

Family, FELIDÆ.

Tubercular grinders small and in the upper jaw only; dental formula as in the order; flesh-tooth 3-lobed; tongue covered with papillæ directed backwards and somewhat re-curved; claws sheathed.

Tribe, FELINA,—TRUE CATS.

Gen. FELIS, *Gray, P. Z. S.* 1867.

Felis leo, *Linn., Syst. Nat.* 1. p. 737; *Jerd., Mam. Ind.*, p. 91; *Sterndale, Pop. Nat. Hist. Mam. Brit. Ind.* p. 159. *Asian, September,* 1880. Felis gujrathensis, *Smee, Trans. Zool. Soc.*

Vernacular.—Untia Bagh, Cent. Ind.; *Sheir,* Hind.

THE LION.

Head large and rounded; ears short; whiskers spreading; colour uniform tawny, lighter on the flanks and on the inner side of the thighs. Male with a heavy shaggy mane; both sexes with a whitish tufted tail.

Length.—9 to 9·5 feet, of which the tail is generally about one-third or one-fourth. Height 3·5 feet. Pupil black, circular; irides yellow.

CSL

Hab.—Guzerat, Kattywar, the Runn of Cutch, Rajpootana, Gwalior, Goona and the Saugor districts of Central India. In the present day confined only to Guzerat and Cutch.

According to Captain Smee, lions are found in Guzerat along the banks of the Sabarmatti near Ahmedabad. During the hot months they inhabit the low bushy wooded plains that skirt the Bhardar and Sabarmatti from Ahmedabad to the borders of Cutch. They extend, it appears, through a range of country about 40 miles in length. In earlier years, when the lion was common, it was considered good game, and the names of sportsmen, like Col. LeGrand Jacob, Sir C. Malet and Sir Cornwallis Harris are associated with large records of kills. From records of measurements 8·75 to 9·5 feet may be taken as the average length of the lion. Capt. Smee is said to have measured a male from tip of nose to tip of tail as 8 feet 9½ inches. A female killed at the same time was 8 feet 7 inches. A record in the *Bombay Sporting Magazine* for 1863 of a lion killed in Kattywar gives the length as being 9 feet. The experience of sportsmen is, that lions do not come out sneaking like a tiger, but that, when disturbed, walks out with his head and mane erect, looking defiantly about him. In 1876 Captain Butler, of the 83rd Regiment, when stationed at Deesa, had a day's lion shooting in the Gir, an account of which was first published in *The Field* and subsequently in the *Asian*, in September 1880. The Gir, he says, consists of a low range of hilly jungles situated in the centre of Kattywar in Guzerat, running east and west, and that it is one of the few places in India where the lion is to be found. His account is that after all the preliminary arrangements of having the animal marked down, getting up a tree, and having the animal beaten up; he after a number of mischances managed to procure one which measured 6 feet 3 inches as he lay, from tip of nose to tip of tail. He says the mane was fair, but as the animal was only about 12 years old, nothing like as large as it would have been if it had been older. Lions generally pair off at each season, but it is a matter of contest, the lioness giving herself up to the victor. During the time the pair are together they are said to show great attachment to each other, and to live together till the young can do for themselves. The lioness goes with young about five months, and produces from 2 to 4 cubs at a litter, more commonly two only. The young, as of cats, are born blind. Aberigh-Mackay, in his "Sport in India," says: "The young are at first obscurely striped or brindled and somewhat tiger like in the coat," and, that there is generally a blackish stripe extending along the back, from which numerous other stripes of the same colour branch off nearly parallel to each other on the sides and tail. The head and limbs, he adds, are generally obscurely spotted, but as they advance in age the uniform colour is gradually assumed, and when about 10 or 12 months old the mane of the male begins to appear. It becomes developed at about 18 months, which is about the period when they begin to roar.

MINISTRY OF CULTURE · GOVERNMENT OF INDIA
GSL

Felis tigris (*Linn.*), *Jerdon, Mammals Ind.* p. 92; *Blanford, East. Pers.* p. 34; *Murray, Handbk. Zool., &c., Sind,* p. 85; *id., Vertebrate Zool. Sind* p. 26; *Aberigh-Mackay, Sport in India,* p. 7; *Sterndale, Mammals British Ind. and Ceylon,* p. 161. Tigris regalis, *Gray, P. Z. S.* 1867, p. 263.

Vern.—Wagh, Deccan; *Bagh, Sheir,* Hind.; *Tagh,* Thibet; *Babr,* Pers.; *Sheenh,* Sind.; *Nahar,* Cent. Ind.; *Nongzachor,* Northern Prov.; *Puli,* Telug.

THE TIGER.

Head large and round; ears short. Color bright fawn to bright rufous, more or less tinged with yellowish or ochrey; sides of the head, neck, and body with irregular transverse black bands or bars; eyebrows and cheeks white, some dark bars on the latter; under parts white, the portion nearest the flanks with a few black bars; tail with irregular black rings, the tip black; whiskers and cheek bristles white. Pupil round, black; irides yellow. Skull 14 to 16 inches in length; in exceptional cases 17 inches. Length variable, the average size of an adult being from 9·5 to 10 feet. Jerdon says occasionally 2 inches or more, a statement borne out by several persons in the controversy in the *Asian* as to the length of the tiger. Height about 4 feet, commonly not above 3·9 inches.

Hab.—The Indian Peninsula to the Malay Archipelago and Central Asia. It is found in Georgia and Bokhara, extends to Persia in the Caspian provinces and Mazandaran and Ghelan lying north to the Elburz mountains. These Provinces, unlike the plateau of Persia, are covered with dense forests, and in them Mr. Blanford says the tiger ranges up to an elevation of 5,000 to 6,000 feet. China, Sumatra, Chinese Tartary and the altaic mountains are other parts where it is found, and Ferrier in his "Caravan Journeys" speaks of tigers north-west of Herat. It is not found in Ceylon, nor in Borneo, but is present in British Burmah and the Malay Peninsula. In the Indian Peninsula it may be said to ascend the Himalayas up to 800 feet. In the Concan, Deccan, Rajputana, Central, and Northern India, as well as in other parts, it is not uncommon, where there are heavy forests and jungle.

Rocks and caves in the proximity of water is the favourite resort of the tiger. In Sind, it is not common, and though it is fairly numerous in the Khyrpoor State, there are not many records of its having caused destruction to man or domestic animals. From Sukkur upwards it is said to occasionally issue from its cover, which is the dense fringe of tamarisk bushes and long grass along the banks of the Indus, and to visit the cultivated parts. In Khandeish tigers are the dread of the inhabitants and almost a scourge, especially in the Malligaum districts, where they are known to carry off inhabitants from the villages whilst asleep outside their huts. The tiger seems to have no other instinct but a constant

CSL

thirst for blood, a blind fury which, as Burroughs says, knows no bounds or distinction, and often stimulates him to devour his own young and to tear the mother in pieces for endeavouring to defend them. It generally lies in wait at the banks of rivers where animals repair for drink, and the bound with which it throws itself on its prey, is as wonderful in its extent as it is terrible in its effects. Pennant observes that the distance which the tiger clears in this deadly leap is scarcely credible. In killing large animals, as a nilghai or buffalo, he seldom tears out the entrails at once, but to prevent interruption drags off the whole carcase to a secure place in the vicinity of its den. As to the tiger's method of securing its prey there is much controversy about. Opinions very materially differ; but the most reliable and generally accepted is that which also accords with my own experience, *viz.*, that he creeps out stealthily until he has got to a certain distance from which he can, with often a a short run of a few paces and a single bound, fix himself on such quarter of the animal as he could best get on from the position of its prey. Usually, however, it seizes the animal by the throat and drags or strikes it to the ground with its fore arms, but in every case his first attempt is to fix his powerful teeth under the neck. Though tigers generally issue in search of prey after dusk, I have known numerous instances where attacks have been made during the day. These, however, proved to be what are commonly called "cattle-lifters." They do not care about the presence of the herdsman, and there is scarcely any effort necessary for one such to secure a prey. The cattle appear to scent the tiger when in close proximity, and to become paralysed with fear in the same way as a bullock when being taken into the slaughter-house. The tiger then selects the best and makes a rush; in these cases always fixing its teeth in the throat of the victim.

The game-killing tiger however is a more nimble and graceful animal, and upon the whole more fierce. It is very shy and retired in its habits, and instead of living in dense jungle and heavy grass, it lives in a cave or on a hill or some rocky ravine in the vicinity of a pool of water. It will seldom attack man unless provoked or wounded. The last type of the tiger is the man-eater, which is generally an old beast, fat, lazy and unable for much exertion. This beast is a night prowler, and if there is one such in the neighbourhood of a village, his whereabouts are said to be known by the unearthly howls of the hyæna, which is said to be almost always found in its trail. He enters a village and obtains his prey in the deep nullahs near by, which the villagers frequent to answer the calls of nature after dusk. If this fails he will watch a very frequented footpath, for the unwary villager returning home late from his fields or from an adjoining village, where probably he went to barter his grain for some other urgent commodity.

The largest proportion of tigers in India may be said to inhabit the Sunderbunds, as well as the Northern and Central Provinces, where the mortality among the inhabitants, and among cattle, reach very high

CSL

figures annually. To encompass the destruction of this tyrant, several modes of shooting are adopted, as well as mechanical contrivances. There is first the shooting from the back of elephants, next, shooting on foot, again from the tops of trees on a platform or from an ambush, and lastly, that of baiting traps and by poison. Notwithstanding all these devices, the tiger cannot be said to be dying out. According to Abrigh-Mackay, in Madras, Bombay and parts of Central India, the sportsman, attended by a crowd of beaters, with drums and other noisy instruments, assails the tiger on foot, searching for the animal in the dense jungle where he makes his midday lair. This mode of encompassing its death is dangerous, and many serious and fatal accidents have resulted from it. In the jungles of the Terai, and generally in Northern India, Bengal, parts of Central India and the N.-W. Provinces, where it is found chiefly in jungle and grass or swamps, and where it would be, as Fayrer says, "perfectly inaccessible on foot," it is hunted from elephants, or is drawn from the grassy retreat towards the elevated platforms on trees, from which the sportsman can aim in safety. I would refer my readers to the numerous articles in *The Field*, *Asian* and other sporting papers on tiger-shooting, and the way in which the animal has been secured, and again for older authorities to "Wild Men and Beasts," "Hunting Grounds of the Old World," "Highlands of Central India" by Forsyth, Campbell's "Forest Ranger," Mackay's "Sport in India," "Rifle and Hound in Ceylon." All these are of interest to the sportsman, but they are most of them now almost obsolete, if taken in reference to controversial questions, especially in regard to the length of tigers. The discussions that have been conducted in *The Field*, *Asian* and other papers, as Mr. Saunderson rightly says, have not quite settled the question; they may, however, be regarded as having been so far profitable, that they have reduced the differences of opinion from yards to feet. I will quote some of Mr. Saunderson's remarks. Of course we seldom hear of tigers 5 yards long nowadays. He says, "dividing sportsmen who take an interest in the question of the length of the tiger into two parties, the moderate and the extreme, that, it will be generally admitted on behalf of the former, namely, those who believe with Jerdon that 10 feet and an inch or two is the extreme length attained by tigers—(I will even give an inch more)—that they can have no object in denying the beast a single line to which he is fairly entitled." He adds, "taking a general view of the question, and having regard to the tendency of human nature to exaggeration, especially in regard to personal exploits, it may be said that the moderate party have a certain amount of probability in their favour, unless they wilfully from a malevolent desire to curtail the dimensions of the largest of the felines, or from a rare modesty prompting them to make the least of their own feats, or from a deliberate intention to oppose the extreme party at the expense of truth, understate the length of the tigers they kill, their measurements may be regarded as being likely to be correct."

CSL

The converse arguments apply against the monster tigers of the extreme party, or those who rely on measurements with strings, pacing, or even guess work, and who trust to their memories. There is certainly a general feeling, as Mr. Saunderson adds, that it is more creditable to shoot a tiger 12 feet long, than one of 9 feet. Whether the danger involved is apprehended to be greater, or whether the natural desire of outdoing one's fellows be the secret, the feeling exists; and though it would be undoubtedly agreeable to have killed the largest tiger ever slain, it is difficult to conceive what pleasure it can afford to say that one has done so without the fact. Then again is the desire to accomplish such a feat, in recognition of the popular taste for large tigers. This would tempt sportsmen to put on a few inches or feet to the length of their tigers according to the liberality of their dispositions.

The correct way in which measurements of tigers should be taken is to lay the animal down on its side in as straight a line as possible, then pull up its head so that the plane of the top of the skull is in line with the backbone or vertebræ, then whether you put in a stake or not at the tip of the nose, you may measure in a straight line by a tape by placing any long piece of bamboo behind the back and measuring from the tip of snout to the insertion of the tail. The same may be done in measuring the tail, and you have as accurate a measurement as you wish. *Curves are not allowed.*

Sterndale, on the other hand, has taken the length of skulls for his investigations as to the possibility of the existence of 11 feet tigers. Giving Sir Joseph Fayrer his due that he had not measured a tiger over 11 feet, and Mr. J. Shillingford his due also, Mr. Sterndale asserts that in Purneah 11 feet tigers exist when the animals have been measnred in sportsman fashion, that is, round the curves. As many sportsmen may not have seen Dr. Fayrer's article in the *Asian*, I extract it, in order that some general idea may be formed of the question of the length of tigers. Dr. Fayrer's article was first published in *Nature* in 1878, and he states there, that his opinion was that tigers attained the length of from 9 ft. to 10 ft. 3 inches, and that he had never himself seen one above 10 ft. 6 inches. The following is the article referred to:—

"In a work on the tigers, published in 1875, I made the following remarks in reference to the size of the tiger:—

"The size of the tiger varies: some individuals attain great bulk and weight, though they are shorter than others which are of a slighter and more elongated form. The statement as to the length they attain are conflicting and often exaggerated; errors are apt to arise from measurements taken from the skin after it is stretched, when it may be 10 or 12 inches longer than before removal from the body. The tiger should be measured from the nose along the spine to the tip of the tail as he lies dead on the spot where he fell before the skin is

MINISTRY OF CULTURE · GOVERNMENT OF INDIA
GSL

removed. One that is 10 feet by this measurement is large, and the full-grown male does not often exceed this, though no doubt larger individuals (males) are occasionally seen, and I have been informed by Indian sportsmen of reliability that they have seen and killed tigers over 12 feet in length. The full-grown male Indian tiger, therefore, may be said to be from nine to twelve feet, or twelve feet two inches, the tigress from eight to ten, or perhaps in very rare instances eleven feet in length, the height being from 3 to 3½ feet or, rarely, 4 feet at the shoulder. The point I now especially desire to elucidate, as it has been the subject of discussion, but is one that has never yet been satisfactorily settled, is the greatest length the tiger attains. Jerdon and others say that the average size of a full-grown male tiger is from 9 to 9½ feet in length, and that he has not seen any authentic account of a tiger that measured more than 10 feet and 2 or 3 inches. I agree with Jerdon that 9 to 9½ or 10 feet and 2 or 3 inches are the lengths attained by the majority of tigers met with; but the occasional occurrence of tigers of upwards of 10 feet 2 or 3 inches (the authenticity of which is doubted) is attested by the evidence of several competent and reliable observers, who are quite aware that the measurements should be those of the animal as he lies where he fell, and before being despoiled of his skin, and that measurement of the skin after removal are deceptive. I have taken some pains to ascertain the views of those who are most likely to be well informed on the subject, and I add the results of my own observations during considerable experience in Bengal, Oude, and Nepaul; it would seem that the evidence wanted by Jerdon is forthcoming, and that tigers above 10 feet 3 inches, 11 feet and even 12 feet are occasionally met with, and have been accurately measured. I may remark that it is very possible that like boars and other animals, they may differ in size according to locality, food, and other conditions of life; and that such being the case, it is probable that tigers of one province or district may exceed those of another in size. Indeed I am inclined to believe that such is the case, and that therefore those who contend for the larger may be equally right with those who maintain the smaller measurements. I am rather inclined to agree with Mr. C. Shillingford, who suggests the possible progressive degeneration of the tiger; what certainly, according to some, obtains in the case of stags in the continuously over-shot deer forests of Scotland, may also be going on in the tiger of the much-hunted jungles of India. However, this is a mere suggestion, but be it as it may, the inches of the big tiger are, I think, an ascertained fact, for it can hardly be maintained that the authorities who vouch for it, are either mistaken or misinformed, or that they do not know how to measure a tiger accurately. Sir G. Yule, K.C.S.I., Bengal Civil Service, says:—"I never had the luck to fall in with a 12-foot tiger; 11 feet odd inches I have killed twice or thrice. I have heard once, at least, of a 12-foot fellow fairly measured, and I cannot see why there should be any doubt as to the occasional occurrence of such exceptions to the rule. Colonel George Boileau, Bengal Army, says he killed a tiger at Mutearah, in Oude, that was well over 12 feet. He writes:—

CSL

‘I can speak positively as to the size of the tiger—his length was well over 12 feet before the skin was removed. He was, of course, quite an exceptional size, and unequalled, as far as my own experience goes, which extended over seventeen years of constant hunting after the species. My own experience of the size of tigers is that, in the female, the size runs from 8 feet to 9½ feet,—the latter exceptionally large; in the male from 9 feet to 11 feet; a well-grown adult tiger is seldom less than 10 feet in length. I speak of hunting grounds frequented by myself (chiefly Oude and Nepal Terai), for no doubt the size varies according to locality and abundance of food, and its reverse must of course produce their usual results.’

“Colonel Sleeman, Bengal Army, says: ‘I don’t remember having killed a tiger measuring more than 10 feet 6 inches in his skin, but I have skins of tigers 11 feet 6 inches in length, and once, at Dinagepore, in Bengal, over 12 feet. I have the skin of the largest tiger I think I ever saw, and it measures 12 feet 2 inches. This tiger was killed near Jubbulpore in Central India, by an old Thakoor sixty years of age, and I preserve the skin as a trophy of native pluck and vigor in age.’ The skins above alluded to were, no doubt, stretched, and therefore do not prove more than that they were taken from large animals, which may have been probably between 10 and 11 feet in length. Colonel J. Macdonald, Bengal Army, Revenue Survey, says:—‘The largest tiger I have ever measured out of 70, was 10 feet 4 inches, and out of all these only 3 have touched 10 feet. But I do believe that tigers have exceptionally reached 12 feet.’ The skin of a tiger, 10 feet in length, as he lies dead, would stretch to nearly 12 feet, but after curing it returns to nearly its normal size. I have often measured the distance between a tiger’s marks on the ground; average and large animals are from 4 feet 4 inches to 4 feet 8 inches. Well! I once found marks 5 feet 10 inches apart; this must have been the mark of a gigantic beast—the breadth of the impression of the fore paw, and the depth of the impression, showed his great size and weight. This was in the Sunderbunds.

“Mr. M., of Morelgunge, told me that once when going through a narrow Creek in the Sunderbunds, he saw a stupendous brute, far exceeding in size anything he had before seen in tigers, or could have believed possible. The heaviest male tiger I have seen weighed 448 lbs.; the lightest, a tigress, 242 lbs.

“The Hon. R. Drummond, B. C. S., late Commissioner of Rohilkund, says:—‘I have never seen a 12-foot tiger. The largest I ever shot was 11 feet 9 inches as he lay on the ground immediately he was shot and before being padded. I measured him because I was struck with his large size.’

“F. B. Simson, Esq., B. C. S., says:—‘I have killed or been at the death of about 180 tigers; I never actually handled one 11 feet long, but I fully believe that they reach that length occasionally, and every now and then a monster is found. The largest skins by far I have seen came from China. I give you the

CSL

exact measurements of several I have killed and fairly measured immediately after death, and before they were padded, with dates:—

		Tigers—Length.		Height at shoulder.	
		Ft.	In.	Ft.	In.
1855, October	15	9	5	3	6
1856, February	13	10	4	3	8
,, ,,	11	10	11	3	7
1858, March	15	9	1		

		Tigress—Length.		Height at shoulder.	
		Ft.	In.	Ft.	In.
1855, October	14	8	8	3	3
,, ,,	13	8	5	3	5
,, ,,	19	8	11	3	5
,, November	22	8	10	3	3
1856, October	6	9	4	3	10¼
1857, February	8	8	10	3	4

"All these were killed on the Churs of the Megna, between Bakergunge and Noakhally. In later years I killed tigers in Purneah, Dacca, Mymensingh, and Assam, but their exact dimensions were not recorded. I do not remember any exceeding generally in size the measurements I have given. I once killed a tiger who stood almost 4 feet at the shoulder. I have often been referred to about hogs. I have taken about 900 first spears, and hunted in nearly every Zillah in Bengal, but I never speared the boar that would not have walked under a standard of 3 feet 3 inches. This statement has disappointed many; but the facts are at your service, and you may use my name to authenticate them when you choose."

Major-General Sir H. Green, K.C.S.I., C.B., Bombay, says:—"The biggest tiger I was ever at the killing of, was in 1848, near Surat, and it measured, pegged out, 12 feet 4 inches. I heard by last mail from Claude Clerk at Hyderabad, who said he had just killed, to his own gun, the biggest tiger he had ever seen, as it measured 11 feet 6 inches before skinning." Sir H. Green, also writes:—"I enclose a letter from Colonel Stuart regarding tigers, and I have made many inquiries about them since, and there can be no doubt that a 12-foot tiger is very rare, although I have no doubt there are instances of that size having been exceeded. I find, by reference to my Journal, that I have a record of some I have killed, and that the one I mentioned as 12 feet 4 inches, pegged out, measured, before skinning, 11 feet 11 inches. Measures before skinning:—

11 feet 11 inches
10 ,, 11 ,,
9 ,, 9 ,,
9 ,, 6 ,, —Tigress.
9 ,, 3 ,,
8 ,, 6 ,, —Tigress; pulled down my elephant."

Col. D. G. Stuart writes:—"I have never seen or heard of a *bonâ fide* 12-foot tiger, *i. e.* as he lay in his skin. The largest I ever saw or killed was, as he lay, 11 feet and ¼ inch, the largest of my victims. I have personally measured eighty tigers. I saw a skin in San Francisco, of a Chinese tiger which might have been 12 feet long in life. I never saw anything Indian to approach it. The Chinese skin was fairly treated, had breadth as well as length, the fur was long and soft. The average size of large males in the Central Provinces I found to be 10 feet 6 inches to 10 feet 8 inches; the tail had a good deal to do with the last two or three inches. The largest tigress I killed was, I think, 9 feet 3 or 4 inches, but I speak from memory. Of two males the girth of the forearm of one was 48 inches, the average being 32 to 34 inches. One of the most remarkable measurements is that of the tail where it joins the carcase. I have repeatedly found the girth in males to be 12 inches."

The Hon. Sir. H. Ramsay, K.C.S.I., C.B., Commissioner, Kumaon, writes:—"I have always understood that Bengal tigers are larger than ours in the North-West. The largest tiger I ever killed measured 10 feet 5 inches, and I consider anything above 10 feet a large tiger. A tigress very seldom gets beyond 9 feet. I have heard of Bengal tigers measuring 12 feet. G. tells me his father, a Bengal Civilian, shot a tiger that measured 12 feet 4 inches, but I never shot in Bengal."

Mr. C. Shillingford, indigo-planter, Purneah, says:—"My experience extends over thirty-five years, during which I have shot more than 200 tigers. In 1844 I shot one of the largest tigers I have ever seen, with a party of four. He measured, as he fell, 12 feet 4 inches, was very old, and his marks had become faint. The hair was short, like that of a greyhound. I shot another tiger which measured, as he fell, 11 feet 10 inches, and another in 1855, 11 feet 4 inches; several of 10 feet 6 inches and 10 feet. The majority of male tigers seldom exceed 10 feet, and many attain only 9 feet 8 inches or 9 feet 10 inches. Cumming says he has shot a few over 11 feet, and gives three instances—one at Rohinipore, 11 feet 4 inches; one at Raliastrich, in 1865, of 11 feet 2 inches; and another at Gour in 1871. My nephew has also shot one or two over 11 feet. I think these very large tigers are rare, and are only to be found in the Ganges Churs; I am also inclined to believe that they are degenerating, as I have not shot large ones for several years; or it may be that there is a keener set of sportsmen now a-days, and no sooner is a tiger heard of than he is shot. The tigresses are seldom over 8 feet, though I have known some that attained 9 feet to 9 feet 6 inches. Cumming says he has seen the claw-marks of a tiger on a tree 18 feet high. The men who are difficult to convince about the large tigers are those who have shot them in hills and rocky places, and those tigers are of a different class and seldom grow large.".

Major Bradford, C.S.I., of the Political Service, says:—"10 feet 5 inches was the largest tiger I ever saw, but I sent the question to Martin, and enclose

CSL

his reply and the enclosures to it. I remember hearing of this immense tiger White speaks of."

Col. C. Martin, Central India Horse, says he shot a tiger at Putulghur 10 feet in length, and alludes to a large tiger shot near Goona by Mr. White, which was measured by Mr. Angelo, and is described as follows by the latter gentleman: "I can remember, beyond all doubt, the length was 12 feet 4 inches from tip of nose to tip of tail; 2 feet 2 inches from ear to ear. The direct breadth of wrist 8 inches, spread of foot 10 inches, heel to withers 4 feet, and the tail was 3 feet in length." The measurements were recorded in the *Delhi Gazette*, but there is some doubt as to their accuracy; so that they may hardly be regarded as proving more than that the tiger was a very large one." Colonel Martin says, in a subsequent letter :—" W.'s tiger, which I had always thought 12 feet 4 inches, is no longer to be relied on for scientific inquiry, though it probably exceeded 10 feet."

Lieutenant James Ferris, B. Army, says: "I have had a good deal of experience, as I have shot in the Central Provinces, and for several years in Oude and Nepal. The largest tiger I know of was shot by Wilkinson, in 1873, in Nepal; he measured 10 feet 4 inches from tip of nose to tip of tail. Wilkinson, who has shot more tigers than most men in India, told me this was the largest he had ever seen; the largest tiger I ever shot myself I got the same season in Nepal; he measured 10 feet 2 inches; he was considered a monster. The tigers in Lower Bengal may be larger, but in the Central Provinces they are certainly smaller; it depends a great deal on how the tiger is measured."

General Ramsay, Bengal Army, says: " The largest tiger I ever saw I shot in conjunction with Colonel Stewart, a fine old sportsman, who died many years ago at Benares. The tiger was not found for some days, when he was discovered dying from loss of blood and starvation. The skin was removed and measured 12 feet from the nose to end of tail. This skin was no doubt stretched. A tiger of 10 feet 6 inches is a very fair-sized tiger. Tigresses seldom grow so large." General Ramsay adds: "My friend Colonel H. Shakespeare writes me that the two largest tigers he ever killed were, when brought in and measured, 11 feet 8 inches and 11 feet 6 inches respectively—the latter a tigress." He does not think he has ever seen larger ones. There probably are tigers that measure 12 feet or more, but they would be very rare.

Mr. F. Buckland has kindly given me the following extract from his "Curiosities," 1866, in regard to a tiger shot by Colonel Ramsay, who says that he and Major B. shot a tiger at Huldwana, in the Kumaon Terai, tha they estimated to be about twelve years of age, and was of the following dimensions :—

CSL

	Ft.	in.
Length from nose to end of tail	12	0
„ of tail	3	9
Height from heel to shoulder	3	7
Girth of body behind shoulder	5	3
Girth of forearm	2	10½
Girth of neck	3	7
From ear to ear	1	6½
Length of upper canines	0	3
„ lower „	0	1¾
„ claws	0	3

On referring to some of my own tiger shooting notes, I find that I have recorded the following measurement:

Oude, Terai, 1855.

		Ft.	in.
1.	Tiger	9	5
2.	„	8	0
3.	Tigress very large, pregnant with five cubs	Measurement not preserved.	
4.	Tiger	10	0
5.	Tigress, large, but measurement lost.		
6.	Tiger	9	0
7.	Tigress	8	10
8.	„	8	11
9.	„	8	9
10.	Tiger Cub	5	9
11.	„ „	9	7
12.	„ „	9	11

Oude, Terai, 1857.

13.	Tigress	8	0
14.	Tiger	8	3
15.	Tigress, with three cubs	8	10
16.	Tiger	Measurement lost.	
17.	Tigress	Ditto.	
18.	„	Ditto.	
19.	Tiger	Ditto.	
20.	Tigress, very large, pulled G.'s elephant down.	Ditto.	
21.	Tiger killed in Hangua (drive) from a tree	Very large.	

		Ft.	in.
	Maldah, Bengal, 1870.		
22.	Tigress	Measurement lost.	
23.	,,		
	Ulwar.		
24.	Tiger	Measurement lost.	
	Purneah, Bengal, 1869.		
25.	Tigress	8	2
26.	Tiger	10	0
27.	Tigress	8	7
28.	,,	Measurement lost.	
29.	,,		
30.	,,		
31.	Tiger	10	8
	Purneah, 1871.		
32.	Tigress	9	0
33.	,,	7	6
34.	,,	7	8
35.	,,	8	8
	Oude and Nepal, 1871.		
36.	Tigress	8	9
37.	Tiger	9	7
38.	Cub	5	5
39.	,,	5	8½
40.	Tigress	8	7
41.	,,	8	6
42.	Tiger	9	6
43.	Tigress	8	8
44.	Tiger	10	6
45.	,,	7	0
46.	Small Cub		
47.	Tiger ,,	9	4
48.	Tigress (I killed her with a single bullet in the neck)	8	11
49.	Her	6	11
50.	three	6	5
51.	Cubs	6	10”

“These are all the notes I can lay my hands on at present. The largest tiger was 10 feet 6 inches, the largest tigress 9 feet. Both were Bengal and Purneah tigers. My own experience, therefore, confirms so much of Jerdon's estimate as that the tiger averages from 9 to 9½ feet, the tigress between 8 and 9 feet; the length of upwards of 10 feet 3 inches and even 11 feet or 12 feet, and the tigress up to 10 feet or even more, is conclusively attested by the evidence of

GSL

the gentlemen whose statements I have quoted. I am indebted to Sir Dighton Probyn for an interesting letter from Captain Gerard, of Goona, a high authority on Indian felidæ. He expresses his belief that tigers seldom, if ever, exceed Jerdon's measurements, a tiger of 10 feet 1 inch being the length of the largest he has ever killed or seen. He refers to examples of large tigers described by various observers, but he doubts the accuracy of the measurements, which he thinks may have been unintentionally exaggerated. His own experience is very large, his accuracy as an observer well known, and his opinion consequently of much value; but it is hardly sufficient to invalidate that of others who are no less competent to note and record facts, and who certainly give a greater length, as the extreme growth of the tiger, than that within which Capt. Gerard limits him. The matter then stands thus: Mr. C. Shillingford, Col. G. Boileau, and Sir C. Reid vouch for tigers of over 12 feet. The same gentlemen, with Sir H. Green, Sir H. Yule, the Hon. R. Drummond, Col D. G. Stewart, Mr. Cumming, and Col. Shakespeare vouch for tigers of 11 feet and upwards. The above, with Col. J. Sleeman, Sir Joseph Fayrer, Mr. B. Simpson, and the Hon. Sir H. Ramsay vouch for tigers of 10 feet 5 inches and upwards, all from measurements taken before the animals were skinned. Unless these gentlemen, (all of whom are accustomed to shoot and measure tigers,) were mistaken, the question of length may, I think, be regarded as decided beyond dispute. In conclusion, after thanking sincerely those gentlemen who have given me information derived from their own experience, I would just say that the mere length of a tiger is not necessarily an indication of his real size. The tail is included in the measurement, so tiger-hunters have ruled that it shall be, but the tail is a somewhat variable element: in some it is long, in others short, and it is quite possible that a 10 feet 6 inches tiger with a short tail may be heavier, stronger, and larger than a 10 feet tiger with a long tail. No doubt any thing over 10 feet is very large, and those of 11 or 12 are rare and exceptional, even though part of their great length may be assigned to an immensely long tail. But I think that, while making all allowances for errors of measurement—which doubtless are not uncommon, though unintentional—there is still sufficient evidence from accurate measurements to show that tigers may exceed 10 feet 3 inches, and that in a few (perhaps rare and exceptional instances) do exceed even 11 and 12 feet."

Gen. LEOPARDUS, *Gray, P. Z. S.* 1867, p. 363.

Of moderate size; tail long; body spotted simply or in the form of rosettes. Pupil round; orbits of the skull incomplete.

Leopardus pardus, *Gray, P. Z. S.* 1867; *Jerdon, Mam. of Ind.* p. 97; *Murray, Handbk, Zool., &c., Sind*; *Gray, Cat. Mam. Br. Mus.*; *Murray, Vert. Zool. Sind.* p. 27; *Aberigh-Mackay, Sport in India*; *Sterndale (Asian), Pop. Hist. Mamm. India*, p. 183.

CSL

Vern.—Chita or *Cheeta, Gorbacha,* Hind.; *Bibiawagh* or *Bibla,* Mar.; *Goorhay*, Hill tribes; *Tendua*, Hind.

THE PARD OR PANTHER.

Colour of the fur deep yellowish fulvous or rufous fawn, with dark spots grouped in rosettes, or several spots partially united into a circular, or quadrangular figure, or triangular in some skins; the spots from 12 to 14 lines in diameter. Outside of the long limbs are several isolated dark spots. Tail as long as the head and body; its extremity in good skins reach when turned back to tip of the snout; in some ½ short of the head or less. Skull 9·25 to 9·5 in length and 5·62 wide. *Length*—Head and body 5·0 to 5·5 feet; tail 41 to 50 inches generally.

Hab.—The Indian Peninsula, Beloochistan, Persia, N.-W. Provinces and Bengal, and in fact throughout India, and North, South and West Africa. In Sind it is found, but is not common, and, with the hunting leopard, affects the hills approaching the Indus, where both prey on the gazelle or ravine deer. Of the two, this species is said to be the dread of the cultivators, as, unlike the hunting leopard, it is often found hiding during the day in high jowaree fields, while the hunting leopard seldom emerges from its hilly retreat. "Everywhere," says Mr Blyth, "it is a fearful foe to the canine races," and Jerdon states it does not confine itself to the forests, but prowls among villages, carrying off sheep, goats, and dogs, and sometimes commits great depredations. On the hills in Sind, Lus Beyla, and in Beloochistan, the inhabitants usually go leopard hunting, not with fowling pieces, but with large heavy clubs, twenty or thirty of them surrounding and beating the animal to death.

Whether the panther and pard, or leopard so called, are distinct species, is a point yet to be settled. The vernacular names for both animals appear the same, "Chita" being applied indiscriminately to both, and is the most *common* names by which they are known. Mr. Sterndale in the *Asian* ("Popular History of Mammalia," &c.) considers them distinct, and proposes the name of *Felis panthera*, a name already assigned by *Schreb* to the South American Jaguar (*Leopardus onca*, Linn.), Gray. *P, Z. S.* 1867, and by Erxl to the Thibetan Ounce, *Uncia Urbis*, Gray, *P. Z. S.* 1867. Cuvier separates the panther from the leopard specifically. The panthera, *La Panthera*, he makes the *Felis pardus* of Linnæus, and the Pardalis (Παρδαλις) of the ancients. The panther he describes as yellow above, white beneath, with 6 or 7 rows of black spots in the form of roses, *i. e.* an assemblage of five or six small simple spots on each side. The tail of the length of the body, not including the head, of *Felis Leopardus*, Cuvier says, is similar to the panther, but with ten rows of smaller spots. Temminck once regarded the panther and leopard as varieties of the one species, *Felis Leopardus*, but in his monograph he has separated them speci-

CSL

fically. Bennet and Swainson (1838) touched upon the subject without coming to any decided conclusion. Major Hamilton Smith (*in Griff*) says the open spots which mark all the panthers have the inner surface of the annuli or rings more fulvous than the general colour of the sides; but in the leopard no such distinction appears, nor is there room, as the small and more congregated dots are too close to admit it." Gray (*Cat. Mam Br. Ms.* 1869) also does not separate the pard and the panther specifically, and as synonyms of *Leopardus pardus* gives, besides those above, *Felis Panthera*, Erxl, *Felis Chalybeate*, Herm., *Felis minor*, Ehr., *Felis antiquorum*, Fischer, *F. Poecilura*, Valenc., *Felis paleopardus*, Fitz., Var black. *F. melas*, Peron. If, however, it is found that the characters of the length of the tail, and number of caudal vertebræ (22) in the panther (instead of 28 as in the leopard) is constant, it would certainly be entitled to specific separation.

The leopard or panther is a stoutly built animal and has very powerful limbs. His attack is made with great confidence; it is more agile and active than the tiger, and more stealthy too. It can jump far better than the tiger, and can also climb trees. It kills more animals and men, comparatively, than the tiger, and it is said does so merely for the purpose of sucking the blood of its victim. Aberigh-Mackay, quoting Shakespear, Baker, Tennent and others, says that the panther though not nearly so big as, nor above ⅓ the weight of the tiger, constantly attacks men unprovoked, kills them in the jungle, also comes into the villages, and even into the houses, and carries away dogs, sheep, and in many cases children. Instances are quoted where they have been known to carry off dogs from the verandahs of houses in Simla, Mussoorie, and other hill stations. Altogether from its stealthy habits, and that of climbing and seating itself on trees, the leopard is a more dangerous animal to hunt than the tiger, and requires much caution.

Felis uncia (*Schreb.*), *Jerd. Mam. Ind.* p. 101; *Sterndale, Pop. Hist. Mam. Ind.* p. 184.

Vern.—Iker, Tibetan; *Sah*, Bhotea; *Phale*, Lepcha; *Barrel-hay*, Simla hillmen; *Thurway* in Kunawar.

THE SNOW LEOPARD OF EUROPEAN SPORTSMEN, OR THE OUNCE.

Pale yellowish or whitish isabelline, with small spots on the head and neck, but large blotchy rings and crescents, irregularly dispersed on the shoulders, sides and haunches; from middle of back to root of tail is a median irregular dark band closely bordered by a chain of oblong rings; lower parts dingy white, with some few dark spots about middle of abdomen; limbs with small spots; ears externally black; tail bushy, with broad black rings. Size,—head and body about 4 feet 6 inches; tail 3 feet; height about 2 feet.

CSL

Hab.—Throughout the Himalayas, and the highland regions of Central Asia.

There is not much known of this animal. It has great interest for Himalayan sportsmen, and though fairly common, there is some difficulty in acquiring specimens, owing to the inaccessible regions in which it is found. It has beautiful fur. "Mountaineer" says that it is found in the snowy ranges on the grassy slopes, below the snow, and in the higher forests of the valleys; and that it preys chiefly on burhel, and musk deer. It seldom approaches villages, or preys on the cattle, except when the flocks are taken on to the distant hills for the summer season, when it occasionally kills a few sheep or goats. He adds that it roams about apparently as much by day as by night, and that it is surprising and unaccountable how it evades and escapes observation, the more so as its principal resorts are the slopes above the limits of forest. "The Old Shikari," writing in the *Forest and the Field*, page 156, mentions having stalked a snow leopard which had evidently been following a burhel. He states that it is a very cunning animal, and notwithstanding that their traces are often seen on the snowy ranges, comparativaly few are bagged. "A. E. W." in his article in the *Asian* of 31st January, 1882, under the head of the "Sportsman's Guide to Cashmere and Ladakh," says that the place where there is the best chance of obtaining the animal is in the Nubra Valley, the road which lies through Leh. Now and again specimens are obtained from various parts of Ladakh. And he also states that it is quite a matter of chance getting a shot at an Ounce. Skins are brought down from Srinagar and other places, which can be purchased for about 20 or 30 Rupees.

Family, CANIDÆ—THE DOG TRIBE.

Tubercular grinders two on each side of the upper and lower jaws. False grinders 2 or 3 on each side of each jaw; molars $\frac{6-6}{7-7}$, more rarely $\frac{7-7}{7-7}$ or $\frac{8-8}{8-8}$. Toes 5-5, straight, free, with worn-tipped claws, the front inner toe raised.

Upper flesh tooth with one inner tubercle, lower with its posterior portion tuberculous.

Canis aureus, *Linn.*, *Syst. Nat.* 1, p. 59; *Jerd.*, *Mam. Ind.*, p. 142; *Gray*, *Cat. Mam. Br. Ind.* 189; *Murray*, *Hdbk. Zool.*, *&c.*, *Sind.*; *id.*, *Vert. Zool. Sind.* p. 35; *Sterndale's Pop. Nat. Hist. Ind. Mam.* p. 237.

Vern.—*Tholuk* of the Makranees; *Kola*, Hind.; *Giddur*, Sind.

THE JACKAL.

Colour of fur variable. During winter, when in good fur, the muzzle is reddish or rufescent brown, with a black patch in the centre, running up between and on the outside of the eyes; there is also a narrow dark streak running up from the hind edge of the eye to just below the ears, where there is a dense patch of rufescent brown hairs. The long moustachial hairs, the groups over the eyes, sides of face and behind the chin are black. The ears outside are pale rufous at the base, a little darker above near the tip and sprinkled with black hairs. There is also a patch of long greyish white hairs in the anterior upper corner of the ear; the inside of the ear is edged for about an inch all round with white hairs, and the extreme margins with very pale isabelline. The forehead is rufescent brown, with some dark hairs intermixed. The chin is dark brown, except a very small patch, which is white just behind its anterior edge.

The upper lip is greyish white or white, continued and spreading behind the dark chin patch on the throat, sides of the neck and a collar filling up the interspace between the white of the throat and the chest, rufescent brown, with black hairs intermixed; neck above, back and sides of the body, grizzled with black and white or rufescent hairs, and in all good specimens there is a saddle-shaped patch of black on the back. There is also a distinct black patch on the root of the tail, the rest of the tail having a grizzled appearance owing to the broad rufescent bases of the broadly black-tipped hairs showing through; extreme tip of the tail black. Length of hairs from the tip of the tail 3 to 3½ inches. The soft under-fur throughout the upper part of the body is dusky grey, except on the forehead, where it is much darker. The anterior two-thirds of the upper parts rufescent, the bases of the hairs being white. Abdomen white or greyish white, as also are the inner side of the front and hind legs to the middle of the thighs, where, and running up behind the haunches and extending in front and down to the feet, it is rufescent, darker on the outside of the thighs. Front of forelimbs rufescent, with a mesial black line, not extending on to the metacarpal portion of the limbs.

Length.—Head and body 30—32 inches; tail 10—12 inches; height at shoulder 16—17 inches.

Hab.—Found throughout India. Hunts in packs, and is the pest of all villages and cantonments, not only as a marauder, but for its unearthly howls in company with those the hyæna. A cry raised by a single individual is taken up in chorus by the pack for a great distance. Jackals are however useful scavengers in camp, cantonment and village, and never being molested increase greatly in numbers annually; being however a prey to wolves, a great number may thus be exterminated. In the Narra districts, and also in Thurr and Parkur, there are many instances of deaths occurring annually from hydrophobia caused by the bites of jackals. It is said that six hours is the most a person survives after the bite. But the jackal is oftener made to bite the earth than it does men. Fox-hunting in India is a misnomer, for animals of that class are rare indeed, and the jackal takes its place.

"A southerly wind and a cloudy sky" proclaims a hunting morning, so it was said in our grandfather's days; but in India, whether hunting the jackal, the wolf, or the fox, almost any weather, except wet, is both appreciable and acceptable, provided there are good coverts and likely finds. Generally, however, it is the jackal who comes out to lose his brush, foxes not being so very numerous anywhere in the vicinity of cantonments, or even within a radius of 12 or 15 miles, but poor jack (the *pheal*, *bhaloo*, *Khole bhaloo*, for whom one cannot find a vernacular proper name) after all his depredations during the night among fowls, crabs, berries, offal, and kitchen leavings, may any morning be unearthed from under a bridge in cantonments or not very far from one. Churchyards, graveyards, dry beds of nullahs, bridges and cactus-bushes, are his chief resorts; and really there is not much run in poor jack; a half mile will quite do him; he gives very little play before the hounds close on him with a lolling tongue and depressed tail. Often, as in the jungles of Sind, especially if beating up a sugarcane field, besides the jackal, the pig and the wolf are often put out of covert, but unless you stick to the wolf in such a case, dangerous results are likely to follow should the pig turn—unarmed as you would be for the occasion. The following extract from the *Asian* of January 3rd, 1880, of "A Bobbery Pack in India" will sufficiently show the ways and means of a hunt:—"On Thursday the first meet of the F— Bobbery Pack (which was raised under difficulties) was particularly bright, and the wind from the north-east, this may perhaps account for the success not being quite so marked as it would otherwise doubtless have been. The meet was fixed at a village three miles down the L— road at 7 a. m. At about 6-45 a. m., the road began to present a pretty lively appearance; carriages containing the fair sex, and bamboo carts, &c., containing sportsmen who had sent on their horses, and a still greater number of soldiers from cantonments, each of whom was bringing his dog to swell the pack, were all verging to the same spot. The gallant master was early at the rendezvous with the three couple of foxhounds (?), whose united age I should be sorry to guess at, but I cannot be wrong in saying with Mr. Jorrocks: 'I have seen better and I have seen worse.' Punctually, at 7 a.m., we began to move off to the first covert, which was about 200 yards from the road, and a goodly cavalcade we presented, being about 50 equestrians in all, including a detachment of Bengal Cavalry to act as whippers-in. The cantonments turned out in full force, and also a fair number of the civil lines. Our sporting Doctor was conspicuous on his gallant grey. The first place into which the hounds were cast (?) was a long straggling piece of sugarcane, but not a whimper proclaimed that there was a jackal afoot, and if there had been, in all probability he would have been chopped in covert, as it was surrounded on all sides by eager pedestrians and whippers-in (*sic.*). A second piece of sugarcane was then tried with the same success and confusion! Suddenly a happy thought struck some learned sportsmen, that perhaps it would be better not to surround the *khet* on all sides, and not make quite so much noise. This idea being communicated to the field by means of shouts, more order was at length observed, which was soon rewarded by a whimper (somebody said a bark), and everybody was at once at the tip-top of expectation and excitement. In a few minutes one of the whippers-in was seen to gallop in the opposite direction

CSL

at full speed—(he evidently saw something break and wanted to mark it down), a few eager ones galloped after him, amongst whom was a sporting subaltern mounted on a big waler, who, after much difficulty, got within shouting distance of the said whipper-in, and on enquiry as to what he had seen, he received the answer, *Kuch nahin, Sahib.*

"The hounds having been collected from the four quarters of the globe, another cast was tried further down the road. A puckha find was the result. Reynard bounded into the open, which was a signal for a general stampede in his direction, the hounds bringing up the rear. At this time the clamour was deafening, so much so that poor little foxy did not know quite what to do. He however disappeared, some said across the road. Here opinions differed and after a hot general discussion every body went home highly pleased with their day's sport." As with the jackal, so with the foxes and the wolf, the manner of hunting or coursing is decidedly similar, and I need only follow this up by giving descriptions of the species found in India proper. Thibet of course and Cashmere too not being British possessions, the species found in these parts will only be mentioned.

Canis pallipes, *Sykes, P. Z. S.* 1831, p. 101; *Gray, List Mam.* p. 58; *Jerdon, Mam. Ind.* p. 137; *Murray, Hdbk., Zool., &c., Sind*, p. 89; *id., Vert. Zool., Sind.* p. 36. Lupus pallipes, *Gray, P. Z S.* 1868, p. 504; *Cat. Mam. Br. Mus.* p. 189; *Sterndale, Pop Nat. Hist. Mam.* p. 232.

THE INDIAN WOLF.

Vern.—Landgah, Hind.; *Buggyar*, Sind.

Colour variable. Hoary fulvous or dirty reddish white, some of the hairs tipped black. Face and limbs somewhat rufous. Lower parts dingy or soiled white; tail black tipped; ears small; coronal crest of skull linear, high; upper sectorial teeth large, elongate; mammæ 10.

The colour of the Indian wolf varies much, both according to season and locality, more generally the fur is fulvous, or dun colour, with scarcely any reddish or rufous tinge any where.

Length.—Head and body 35—40 inches; tail 15—17 inches; height 24—28 inches.

Hab.—Sind, also Kutch, the Deccan and Concan, Khandeish and throughout India nearly. This is the common Indian species. Sterndale describes *Canis laniger*, the Tibetan wolf, and *Canis lupus*, the European species, both of which cannot be classed as Indian, although it is supposed by Mr. Blanford, from skulls sent by me to the British Museum, that the latter is the species found in Upper Sind and in Beloochistan. There is not much done in the plains of India, in the coursing of wolves, though it is not uncommon when one breaks covert to follow it up in preference to the jackal. The habits of wolves are too well known to need description, but there is this much in

CSL

favour of the Indian species, that unless very hard pressed with hunger it will not attack men, though records are common of children having been devoured in the villages of the S. M. Country. Their chief prey are sheep and antelopes.

VULPES—FOXES.

Muzzle lengthened, acute. Temporal crests of the skull linear. Ears large, erect; tail with soft fur, long and bushy, and reaching to the ground. The Indian species, which will be here described, are—*Vulpes Bengalensis, Vulpes leucopus, Vulpes montanus* and *Vulpes pusillus*; *V. ferrilatus* of Tibet, *flavescens* of Persia, and *Griffithi* of Afghanistan being omitted as not belonging to the Indian fauna.

Vulpes Bengalensis, *Shaw, Zool. I.*, p. 230; *Jerd., Mam. of Ind.* p. 149; *Gray, Cat. Mam. Br. Mus.* p. 204; *Murray, Hdbk. Zool., &c., Sind,* p. 90; *Serndale, Pop Nat. Hist. Mam.* p. 243.

THE INDIAN FOX.

Vern.—Lokree, Lookar, Loomur, Sind.; *Loomree,* Hind.

Fur reddish grey or rufescent above and below: colour varying considerably, seasonally. Ears dark brown externally; tail long, bushy, tipped black; chin and throat whitish.

Length.—Head and body 21—22 inches: tail 12—14 inches.

Hab.—Sind, Punjab, Kutch, Guzerat, Deccan, Concan, and throughout India, affecting the plains; burrowing usually in mounds. In Sind its chief food appears to be (from dissection of several examples) the berries of *Grewia* and *Zizyphus*; also field rats, and a large rock lizard, *Uromastix Hardwickii.*

Vulpes leucopus, *Blyth, J. A. S. B.* 1854, p. 729; *Jerd., Mam. Ind.*, p. 151; *Gray, P. Z. S.* 1868, p. 516; *Cat. Mam. Brit. Mus.* p. 204; *Murray, Hdbk., Zool., &c., Sind.*

THE DESERT FOX.

Fur variable; general colour fulvous white, mixed with darker brown or black; face lighter in colour; tail largely tipped with white. Lower parts nigrescent. Ears black posteriorly. Females usually with whitish limbs. During winter the muzzle is fulvous white, the long moustachial hairs, and the groups above the eyes and behind the angle of the mouth are black: the fur is very variable. Forehead pale rufous, in some specimens bright rufous, sides of the face, chin and throat and the inner sides of the limbs fulvous white, a dark stripe running down from the corner of each eye to about the middle of the edge of the upper lip.

Ears edged all round with fulvous white, externally they are blackish, with, in some specimens, a rufous tinge, the extreme margins fulvous white. Back

MINISTRY OF CULTURE · GOVERNMENT OF INDIA
GSL

and upperside of the tail and the outside of the limbs brighter rufescent than the forehead, with a large admixture of white, which colour is chiefly that of the apical rings on the back, while on the flanks, tail and sides of the neck there are more black than white apical rings. Under parts fulvous white, soles of the feet dusky brown. Tail largely tipped with white.

Hab.—Sind, Kutch, Rajpootana, and the Punjab. Affects chiefly the sandy dunes, and lives on field rats, etc.; oftentimes associated with the next in Upper Sind.

Vulpes pusillus, *Blyth, J. A. S. B.* 1854, p. 729; *Gray, P. Z. S.* 1868, p. 517; *Cat. Mam. Br. Mus.* p. 205; *Jerd., Mam. Ind.*, p. 153; *Murray, Hdbk., Zool., Sind.*

THE SMALL PUNJAB FOX.

Fur variable, general colour pale fulvous, darker on the sides and lighter on the shoulders. Middle of back rufous; tail greyish; ears externally velvetty black. A faint eye streak; cheeks whitish. Tail white tipped.

Length.—Head and body 24 inches; tail 14 inches.

Lives chiefly on the Jerboa rats which are common on sandy plains.

Vulpes montanus (*Pearson*), *Jerd., Mam. Ind.* p. 152; *Sterndale, Pop. Nat. Hist. Mam. Br. Ind. No.* 140.

Vern.—*Loh*, Kashmir; *Lowrie*, Hind.

THE HILL FOX.

Very similar to *V. pusillus,* but larger, measuring, head and body, 30 inches; tail 19. Fur in some specimens of a brighter hue.

Hab.—Found throughout the Himalayas.

ARCTOIDEA—PLANTIGRADE MAMMALS.

Family, URSIDÆ—BEARS.

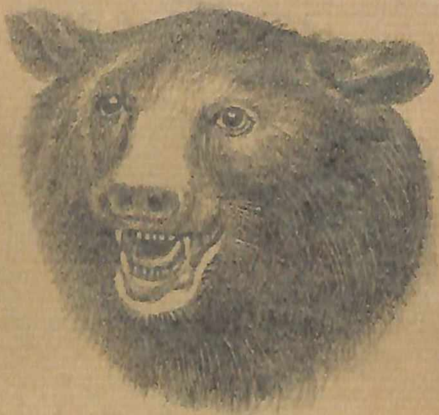
Plantigrade mammals with normally $\frac{6}{6}$ incisors; canines $\frac{1-1}{1-1}$; pre-molars $\frac{4-4}{4-4}$; molars $\frac{2-2}{3-3}$. Two tuberculated teeth on each side in the upper jaw, and one or two in the lower jaw. Feet broad and short, and generally callous below. Tail short. Nose rather produced.

Ursus, *Gray.*—Teeth as in the characters of the Family. False grinders or molars small, distant, often deciduous. Hinder tubercular molar large, elongate; larger than the flesh tooth.

Ursus tibetanus, *F. Cuv. Mam. Lithog. t*; *Jerdon, Mam. Ind*, p. 70; *Murray, Hdbk., Zool., &c., Sind.* Ursus torquatus, *Schinz, Syn. Mam.* p. 302; *Gray, P. Z. S.* 1864, p. 688; *Cat. Mam. Br. Mus.* p. 226. Helarctos malayanus, *Hodgson, J. A. S. B.* 1. p. 340.

CSL

MAMMALIAN GAME



BLACK BEAR

Ursus Thibetanus

Vern.—Reench or *Reech*, *Baloo*, Hind.; *Mumh*, Bet., *Reech*, Sind.

THE HIMALAYAN BLACK OR THIBETAN BEAR.

Fur black, lower lip and chin white. A broad forked white mark on the chest, rather contracted behind; cheeks with bushy hairs; face brownish; neck thick; head flattened; ears rather large; upper tubercular molar elongate, half as long again as the flesh tooth.

Hab.—The mountains of Sylhet and Nepaul, on the Himalayas, and the hill ranges of Assam from 5,000 to 12,000 feet; said to be rare in Thibet. Inhabits the hill ranges in Sind and Beloochistan, where probably it feeds on roots, also the fruits of *Grewia*, &c., and honey. It had long been maintained that a bear inhabited the hills of Sind and Beloochistan, but till Major Mockler, the Political Resident at Gwadur, obtained several skins on the hills near Mand, nothing positive was known as to its identity. It is said to eat flesh occasionally, and Capt Baldwin, in his "Large and Small Game of Bengal," mentions that it is not only a flesh eater, but also a foul feeder, having himself seen one make a meal off a bullock that had died of disease.

Fabulous stories as to the habits and propensities of this species for carrying away women and children are repeated by Beloochees.

The Himalayan Black Bear does not only show fight when wounded, but has been known to attack men without any provocation whatever. "Spindrift" (*Asian*, May 11th, 1880, p. 38,) is correct, that it is altogether about the most fierce, vicious, and dangerous brute to be met with either in the hills or plains of India. His experience does not differ from mine that they inflict the most horrible wounds with their paws and generally on the face and head. "Spindrift" adds that "he has repeatedly met natives in the interior frightfully mutilated by encounters with the Black Bear, and cases in which Europeans have been killed by them are by no means uncommon. These brutes are totally different in their dispositions to the Brown Bear (*Ursus isabellinus*), which however desperately wounded, will never charge. I believe there is no case on record of a hunter being charged by a Brown Bear; or even of natives, under any circumstances, being attacked by one; whereas every one, who has ever marched in the Himalayas, must have come across many victims of the ferocity of *Ursus tibetanus*. As I said before, this brute often attacks man without any provocation whatever. Two cases are quoted by "Spindrift" from his experience, which may not be without interest. He says:—An officer shooting near my camp was stalking some *Thar*. He was getting close to them, when a black bear rushed out at him from behind a large rock on his right and above him. He was so intent on the *Thar*, and the brute's rush was so sudden, that he had barely time to pull from the hip, but he was fortunate enough to kill the animal almost at his feet. I heard this from him on the morning after it happened. On another occasion I was shooting in Chumba with a friend.

CSL

One evening we encamped at a village about which there was as usual a little cultivation on terraces, and a good many apricot trees. Lower down the khud there was a dense jungle. The villagers told us that a black bear had been lately visiting these trees and generally came out about dusk, so that if we would go down and wait, we should be pretty sure of a shot. We went, and took up positions behind the trees, about 200 yards apart, each of us having a man from the village with us. Intervening jungle prevented us from seeing each other. I had not been at my post for more than 10 minutes, when I was startled by a loud shriek and cries from the direction of my companion. No shot was fired, and the cooly with me said that the bear had killed some one. In less than a minute I had reached the spot where I had left my friend, he, and the man with him, had disappeared, but guided by the shrieks, which still continued, I made my way into the thick cover in front of his post, and about 50 yards inside it, much to my relief, came upon him, rifle in hand, standing over the dead body of a man, over which two people—the cooly that had been with my friend and an old woman—were weeping, and shrieking loudly. 'Look out,' said I, as I came up, 'the bear has just killed this fellow'; the first thing to be done was to carry him out into the open. I helped to do this, and directly I touched him, I felt that he was stone cold, and a further examination showed that he must have been dead some hours. That he had been killed by a bear was also very evident. He was naked to the waist, and had been cutting grass. His bundle lay by him and the long curved kind of sickle, that the hill men used to cut grass with, was stuck in his girdle, showing that he had not had time to draw it to strike one blow in his defence. The mark of the bear's paw on his left side was quite distinct. This had felled him to the ground, and then the savage brute had given him one bite—no more—but that one had demolished almost the whole of the back of his head and death must have been instantaneous. The man had apparently cut his load of grass, and was returning with it to the village, when he disturbed the bear, which attacked him at once. The old woman was his mother, and the cooly with J. some relation. Her son having been away all day, I suppose the old woman had gone to look for him. She found his body, as described, just below J.'s post, and at once set up a lamentation which brought the cooly, J.'s attendant, down to her, and J. following himself, thought, at first, that a man had been killed then and there. There was such a row kicked up that no bear came near the apricots that night, and the next day we had to march as our leave was up. I have heard of many other cases of the black bear attacking without any provocation, and from what I know of the brute, I quite believe them, and after all the animal is not worth shooting. Their skins are always poor and mangy, and generally so greasy that they are very difficult to keep until you can make them over to the dresser. The skin of the Snow or Brown Bear, on the other hand, particularly if shot early in the season, is a splendid trophy, and forms a most beautiful and luxuriant rug, the fur being extremely soft, and several inches in depth."

CSL

"A. E. W.," in his "Guide to Sportsmen in Cashmere and Ladakh," *Asian*, 4th January, 1881, p. 93, says that the Black Bear (*Ursus Tibetanus*), or the Harput of the Kashmiris, is steadily decreasing in numbers in the Happy Valley. There are, we consider, more in our own territory, in Ghurwal, in Chumba, and in many other parts than are now to be found in Cashmere. Black bears are easily shot, and the sportsman is not called on to endure any of the hardships which must necessarily be undergone during the pursuit of the mountain sheep and goats. The bear is still sufficiently common for a few to fall yearly to the rifles of most of the visitors. The sport is, however, but poor; there is little excitement in it, as a fight is the rare exception to the rule. The majority killed are shot in the walnut and apple trees, and in the Indian corn crops. Some of the males are very large, one measured was six feet six inches in length, but most are under six feet. A very fine bear skin from the Lolab, when tanned, was six feet four inches long by four feet broad across the back, and five feet over the hind quarters. The females are much smaller, and seldom have good coats. The hair on the belly is thin and coarse even during the winter months. The fur is at its best rate in November, when the black bear may sometimes be shot in the hawthorn trees, but it is very difficult to carry out a stalk at that season owing to the dryness of the fallen leaves, and the slipperiness of the grass.

The bear will eat carrion, and is sometimes accused of killing calves and sheep when pressed with hunger; and we believe this to be true, although rarely the case. Fruits of various sorts—honey, grubs and corn—are the usual food. From March 15th to May 15th are the only months in the season that the hair is still in good condition, so that the majority of the visitors to the valley are obliged to get a good trophy during that time, or not at all. Almost any shikaree is capable of taking the sportsman up to bears, or of driving them out if supplied with sufficient help by the villagers. The localities likely to yield the greatest number of skins are:— The Lolab valley, throughout the hills near Baramulla in the Hammel pergunna, the Bandipoorah nullah, the Scinde valley as high up as Goond, the Liddar as far as Aroo, not forgetting the hazel-woods of Lidroo and above Palgaum; during the Autumn months, the Nowboog, the northern slopes of Gulmarg up to Sheepyan, and in fact almost all jungles in the vicinity of ripe fruit and crops.

In speaking of Bears, a writer in the *Asian*, 1880, June 22nd, p. 80, quoting another of Scandinavian fame in regard to a bear's banquet—could not have better described the habits in this respect of the Indian species. The quotation runs:—"The bear feeds on roots and the leaves, and small limbs of the trees: he is also fond of succulent plants, such as angelica and mountain thistle. To berries he is likewise very partial, and during the Autumn months, when they are ripe, he devours vast quantities of cranberries, blueberries, raspberries, strawberries, cloudberries and other berries common to the Scandinavian forests. Ripe corn he also eats, and sometimes commits no small havoc

20885

SECRETARIAT GOVT. OF INDIA

amongst it, for seating himself on his haunches in a field of it, he collects with his outstretched arms nearly a sheaf of it at a time, the ears of which he then devours." The bear thus spoken of is the Brown Bear of Northern Europe, but all the other members of his family—always excepting the grizzly sort—are equally vegetarians. The Musquair, or Black Bear of North America, will restrict himself to a vegetable diet unless pressed with hunger. A very pardonable exception is made by him in favour of the little snails which come up to feed on the sweet prairie grass— delicious eating, no doubt as pleasant as the fawn-coloured snail that is gathered in such quantities in the Limousin, and eaten with so much zest by the Parisians. The Syrian Bear delights in the chick-pea; the Sun-Bear of Thibet goes in for mangoes; the Bruang of Malayana, also a Sun-Bear, finds nothing so delectable as the tender shoots of the cocoanut trees; the Bor-Bruang prefers the ripe fruit itself, and is able to account for or give a good account of the milk in the cocoanut, of which he is extremely fond ; and so on of the rest, none of them taking to animal food unless fruit or vegetable be not procurable. But of all the good things the gods have provided, that in which the bear most delights, to him the most toothsome dainty in existence, is honey. There is nothing a bear will not do to get at honey. What jam is to children, honey is to bears. Given a tree all but inaccessible in which the bees have deposited their saccharine store, and up climbs the bear in search of the food he loves. Few trees afford so unstable a footing that the Black Bear will not surmount them in order to reach a nest of wild bees, and there are few obstacles which the ready claws and teeth will not remove in order to enable him to reach the subjacent dainty. Even if the honey and comb be deeply concealed in the hollow of a tree, and the entrances by which the bees find ingress and egress to and from habitation be too small for the insertion of a paw, the bear will set steadily to work with his teeth and deliberately gnaw his way through the solid wood until he has made a breach sufficiently wide to improve his purpose. When once he has succeeded in bringing the comb to light, he scrapes them together with his forepaws and devours comb and honey and young without troubling himself about the stings of the surviving bees." Pliny asserts that bears have a motive for eating honey besides the actual pleasure it affords :—"Subject are they many times to dimness of sight, for which cause especially they seek after honeycombs, that the bees might settle upon them and with their stings make them bleed about the head, and by that means discharge them of the heaviness which troubleth their eyes." Of the docility of the bear, there are thousand instances on record ; indeed one has only to see him made the Bhalluwallah's plaything ; like Samson he is brought out to make sport for the Philistines. Nature has enabled this plantigrade to stand upright, and art has been called to improve upon nature. A well-taught bear can shuffle you a saraband, or whirl you a waltz with as clumsy a grace as any who grin and gaze at him. As a member of a *corps de ballet*, he may hold up his head or his leg anywhere ; as a singer he would prove a failure. Yet the family

CSL

voice is not without flexibility, and Agassiz has so far assimilated the cries of animals to human tongues as to affirm that it would be easy to derive the growling of different species of bears, one from the other, in the same way and by the same process that linguists resort to to demonstrate the relation which exists between Greek and Sanskrit. Careful and earnest teaching might, therefore, improve the growl of the bear till it equalled double-bass. Indeed we have heard some bassi whose lower notes might easily have been mistaken for the untutored utterance of a bear. The Bruin's docility is more agreeably exemplified in the facility with which he adapts himself to the circumstances of domestic life. Lord Byron's was not a bad specimen of what may be achieved by classical education, and it is said that this bear's manners contrasted not unfavourably with those of the Dons of Trinity. Tiglath Pileser, familiarly called 'Tig,' was a bear of whom the University of Oxford was justly proud; he wore a regulation cap and gown, became them as well, and conducted himself with as much propriety as most undergraduates. 'Tig' never 'sported the oak' to keep out clamorous creditors; nor is it on record that he gave wine parties or got drunk. To drink wine, however, is a feat a bear can accomplish; for Sir Stamford Raffles, when in Ceylon, had one, a Malayan Bruang, who addicted himself to champagne, and would taste no other fermented liquor, wherein he displayed great judgment. A gentleman owned a brace of brown bears, which he had tamed when young, and as they grow up they became the most gamesome, and, as it were, larkish of animals; if he close the door against their importunity—for they were never easy out of his company—they would make a forcible entry by the window. How gently the bear can behave is shown in a story told of a Siberian Brown Bear. Two children, of four and six years of age, had wandered away from their home, and were after a time missed by their parents, who set out in search of them. To their horror and astonishment they found their children engaged in play with a large bear, which responded to their infantine advances in a most affectionate manner. One or the other had mounted on its back, and was seated on its strange steed strong in the fearlessness of childish ignorance. The parents gave a terrified scream on seeing the danger to which their offspring were exposed, and the bear on seeing their approach quietly turned away, and went into the forest. The Negroes in the West Indies say of the monkey that they are too cunning to talk, knowing that if they did they would inevitably be set to work. Bears, with all their cultivation, are not so shrewd, or they would not have submitted without growling to the tasks imposed upon them by the Indians or Luke Champlain, who—the period is A. D. 1611—'have tamed bears which they teach to carry them upon trees for want of ladders.' This statement is made on the authority of M. de Monts, who undertook a journey and voyage of exploration with the object of piercing through North America by the river Canada, 'which the savages call Kebec,' to be able to reach one day to China. From these few instances it has been shown that the bear is capable of developing as many good qualities as are

CSL

generally to be met with in good society. Without absolutely acceding to the doctrine, which is variously held, that animals have souls, but leaving it an open question for philosophy, when wise enough to determine, we quite agree in thinking that they express something which is fundamentally characteristic. We understand by this definition a capacity for feeling and for expressing feeling in a way that assimilates more or less nearly to reasoning, according to the animal's natural endowments, many of them possessing far higher qualities than others.

Ursus Isabellinus (*Horsf.*), *Jerd.*, *Mam. Ind.* p. 269.

Vern.—*Barf-ka-rich* or *Bhalu*, Hind,; *Harput*, Kashmiri; *Drin-mor* Ladakhi.

THE HIMALAYAN BROWN BEAR.

Of a yellowish brown colour, varying somewhat according to sex and time of year. According to Jerdon, in winter and spring the fur is long and shaggy, in some inclining to silvery grey, in others to reddish brown; the hair is thinner and darker in summer as the season advances, and in autumn the under fur has mostly disappeared, and a white collar on the chest is then very apparent. This collar is seen distinctly in the cub. The females are said to be lighter in colour than the males. Eyes black.

Hab.—The Himalayas, and at great elevations in summer close to the snow. The localities recommended by "A. E. W." in *Asian*, 1881, p. 93, are Shamshibri, then northward towards the Shardi and Gumot nullahs. Up the Kishengunga it is noted from Keyl, Foulweni, and Gugai, Gurais and Tilail are justly famous. Going south-east from Tilail are Dras and Zogila. Then should be mentioned Ledarwat and Pangitarni lying towards the sacred caves of Amarnath. Crossing over the passes a drop down into the Sunyan Valley, and followed down to Sooknis, then through the Wardwan, and after that the famous Ibex nullahs of Krishnye, and Taesnige. These are all the favourite haunts of *Ursus Isabellinus*. Possibly the Tosh-a-Maldan also, but the Pir-Panjal range, although holding brown bears, cannot be compared with the other localities mentioned. According to "A. E. W." ("Guide to Cashmere and Ladakh") the brown bear (*Ursus Isabellinus*), is the Harput or Lal Balu of the Kashmere shikarees, the Drin-mor of Ladakis, and is much more worthy of pursuit than the black variety. It is easily approached if stalked against the wind, and seldom shows fight; it also carries a splendid coat. In April, brown bears come out from their winter retreats, and may then be seen digging in the snow, and endeavouring to find the bodies of Ibex which have been overwhelmed in avalanches; but more often they are viewed on some southern slope when engaged in searching for earth-nuts and the roots of grasses, or in turning over loose bones, and greedily licking up the grubs concealed beneath. They have been shot very low down in Hammel, but as a rule

GSL

are not found at a lower altitude than 8,000 feet. Jerdon mentions one as being 7 feet 6 inches in length. We are unable, he adds, to give any measurements as large as this, and would feel inclined to put the average measurement of a male at 6 feet or a little over. One very large skin, which we have lately measured, was 6 feet 10 inches (5 feet 10 inches over the back and 6 feet 6 inches over the hind quarters). This is one of, if not the largest, we have seen. April and May are the best months for sport, as the brown bear does not shed his fur until June. Again in November, before the hibernating season, they may be often found in the summer quarters of the sheep and goats. They frequent these spots shortly after the flocks have left, in order to feed on the green grasses which spring up near the sheep folds; and to dig up the grubs and mice which infest those spots. In years gone bye 20 to 30 bears were killed by a sportsman in one season, but now seldom more than 7 or 8 can be shot to one gun. Still less numerous will they become, for the skins are greatly prized, and the long fur, varying in colour from brown to almost a yellowish white, is certainly handsome, and looks well as a hearth or carriage rug, or mounted on red cloth, or with a trimming of black bear skin. Be careful not to peg out skins, exposed to the direct rays of the sun, for the dry air and the hot sun of the high altitudes where the brown bear is obtained, are apt to make the hide quite hard, and render it difficult to cure. They litter in April and May, the female generally having two cubs. It is when these have become about two months old that they descend to the lower hills and resort to plantations, cornfields, and the apricot and walnut preserves, in order to teach the young how to subsist on more than mother's milk. Corn crops are however the most affected by them at this time.

Ursus labiatus, *Blainv.*, *Jerd.*, *Mam. Ind.* p. 71.

Vern.—*Bhalu*, *Reench*, Hind.; *Riksha*, Sanscrit; *Aswail*, Mah.; *Elugu*, Tel.; *Kaddi* or *Karadi*, Can.; *Jerid* or *Asol* of the Gonds; *Banna* of the Coles.

THE COMMON INDIAN SLOTH BEAR.

Hab.—All over the Peninsula of India. Also Assam and the Bhutan Duars. Hair very long and shaggy, all black with the exception of a white V-shaped mark on the chest; muzzle dirty whitish, also tips to its feet; snout prolonged and flexible; claws very large. Eyes black. Height nearly three feet.

The following is what Mr. Saunderson has to say of this species:—"Our old friend is so well-known that he hardly requires description, and the very thought of him brings back many a ludicrous and exciting scene of one's jungle days. There is frequently an element of comicality in most bear hunts, as well as a considerable spice of danger, for though some people

CSL

pooh-pooh this, I know that a she-bear with cubs is no despicable antagonist. Otherwise the male is more anxious to get away than to provoke an attack. This bear does not hibernate at all, but is active all the year round. In the hot weather, it lies all day in cool caves, emerging only at night. In March and April, when the *Mohwa* tree is in flower, it revels in the luscious petals that fall from the trees, even ascending the branches to shake down the coveted blossoms.

"However not only do all animals, carnivorous as well as herbivorous, like them, but they are highly appreciated by the natives, who not only eat them raw, but dry them in the sun, and thus keep them for future consumption, and also distil an extremely intoxicating spirit from them. Of honey, as well as termites, it is extremely fond. It will never pass an ant hill without digging up its contents, especially those of white ants. About twenty years ago my first experience of this was in a neighbour's garden. He had recently built himself a house and was laying out and sowing his flower beds with great care. It so happened that one of the beds lay over a large ant's nest, and to his dismay he found one morning a huge pit dug in the centre of it to the total destruction of all his tender annuals by a bear that had wandered through the station during the night."

Tickell describes the operation thus:—"On arriving at an ant-hill the bear scrapes away with the fore feet till he reaches the large combs at the bottom of the galleries. He then with violent puffs dissipates the dust and crumbled particles of the nest, and sucks out the inhabitants of the comb by such forcible inhalations as to be heard at two hundred yards distance or more. Large *larvæ* are in this way sucked out from great depths under the soil. Insects of all sorts seem not to come amiss to this animal, which systematically hunts for them, turning over stones in the operation. The sloth bear has usually two young ones at a birth. They are born blind, and continue so till about the end of the third week. The mother is a most affectionate parent, defending her offspring with the greatest ferocity. She carries her cubs on her back. A she-bear with cubs is always an awkward customer, and she continues her solicitude for them till they are nearly full grown."

"The young ones are not difficult to rear if ordinary care be taken. The great mistake that most people make in feeding the young of wild animals is the giving of pure cow's milk. Of one he had he says the little brute was as savage as his elders, and would do nothing but walk to the end of the string by which he was attached to a tent peg, roll head over heels, and walk in a contrary direction, when a similar somersault would be perfomed ; and he whined and wailed just like a child ; one might have mistaken it for the puling of some villager's brat. Milford was going to give it pure cow's milk, when Fordham advised him not to do so, but to mix it with one-half the quantity of water. 'The great mistake

GSL

people make,' he said, "who try to rear wild animals, is to give them what they think is best for them, viz., good fresh cow's milk, and they wonder that the little creatures pine away and die instead of flourishing on it.' Cow's milk is too rich; buffalo's milk is better, but both should be mixed with water. It does not matter what the animal is, tiger-cub, fawn, or baby monkey, all require the same caution."

Although, as a rule, vegetarian, yet this species is not altogether free from the imputation of being a devourer of flesh when it comes in its way. In such cases it possibly has been impelled by hunger, and I doubt whether it ever kills for the sake of eating. Mr. Saunderson mentions an instance when a barking deer he shot was partially devoured by a bear during the night.

Family, SUIDÆ,—PIGS.

Head pointed. Snout blunt. Ears large. Body compressed. Skin covered with bristles. Molars tubercular, with a few separate roots. Canines in the males large in both jaws, the lower pair prismatic, triangular; the upper round, recurved. Teeth 40—44. Incisors various, $\frac{3-}{3-3}$; Premolars $\frac{4-4}{4-4}$ or $\frac{3-3}{3-3}$ molars; teats 10, rarely 8.

Sus, *Linn.*

Face conical, simple, or with 2-3 warts on each cheek. Ears ovate, hairy. Tail moderate, tufted. Incisors $\frac{4}{6}$ or $\frac{6}{6}$.

Sus cristatus, *Wagn.* Sus aper, *Hodgs., J. A. S. B.* x., p. 91. Sus scrofa *var* indicus, *Horsf., Cat. H. E. I. C. Mus.* Sus indicus, *Gray, List Mam. Br. Mus.* p. 185; *Horsf., P. Z. S.* 1852; *Murray, Hdbk., Zool., &c., Sind*; *Murray. Vert. Zool., &c. Sind.* p. 54.

Vern.—*Boora Janwar*, Hind.; *Dookur*, Mahr.; *Ratpunny*, Madras; *Soour*, *Dhookar*, Sind.

THE INDIAN WILD BOAR.

Bristles of forehead, occiput and back elongate and forming a recumbent mane; cheeks with a beard. A bundle of long black bristles on the throat. Body scantily covered with hair of a brownish-black and yellowish-brown colour. Tail covered with short hairs, and with long lateral bristles; nose and extremities brownish; ears moderate, covered with scattered bristles; head without any warts. Hoofs black. The young is of a fulvous colour, and striped with dark brown.

Length.—Head and body 5 feet or more; tail 1 foot. *Height*—30 to 31 inches. Skull; length—13 to 15½ inches; height 8½ to 9 inches. Concavity on cheek, in front of orbit, deep and wide behind (variable in depth), and separated from the orbit by a well-marked ridge.

CSL

Hab.—Whole of India, to the foot of the Himalayas and Arrakan, from the level of the sea to 12,000 feet elevation.

Aberigh-Mackay, in his "Sport in India," very truly says that "Pig-sticking, or boar-spearing, is the grandest sport that India or any country affords. It combines steeple-chasing and fighting with hunting, and demands every instinct of the hunter with the dash and courage of the soldier. It requires—

> Youth's daring spirit, manhood's fire,
> Firm seat and eagle eye
> Do they require,
> Who dare aspire
> To see the wild boar die.

The pig-sticker must be above all things an expert horseman. He will have to gallop at the highest speed over stony and broken ground intersected by ravines, and covered with dense brush-wood and grass that conceals every danger. His horse, greatly excited—a hot Arab, or powerful Waler—must be kept under perfect control by the pressure of the legs, and the influence of the bridle-hand, the other being occupied with a spear. The charge of the wild boar, moreover, frantic with rage and fear, has often to be received on a horse either plunging, or trying to bolt; and it must be remembered that the pig rushes at his foe, and, with a twist of his snout, inflicts his terrible wound like a flash of lightning. The hunter loses his seat at the peril of his life, while he misses to catch the boar on his spear at the price of his horse, or, perhaps, his own leg. Though it is not often necessary to leap a fence, there are ugly nullahs, brimful of water, or dry and precipitous banks to be got over. The ground is hard and honeycombed with cracks and with the holes of foxes and jackals, both horse and rider may come down headlong when going at racing speed. Sometimes the boar has the best of it in a charge, or the horse swerves and deposits his rider on the hog's back, just as he is bending forward to deliver the spear, or an incautious youth throws the spear, *telum imbelle*, like a dart, in which case it has been known to turn right over, like the caber in Highland sports, and to strike the next horse full in the chest, the point coming out under the poor steed's tail." He adds "the course of true hog-hunting is not always more smooth than that of love. Sometimes the ground is clay-trodden unevenly when wet, by cattle, and then hardened into the consistency of iron. Sometimes the boar skirts the edge of a marsh or swims a deep river, or takes to a line of gardens or orchards, in the midst of which lie buried the houses of the Bengali peasants, where the hunter gets bewildered amongst shady and narrow paths crossing each other at right angles, and may either lose the chase altogether, or be suddenly charged by an enraged tusker where there is no room for him to practice the least cavalry manœuvre. Hog-hunting, like sport of many kinds in the East, is not now what it was. Select hunting-grounds, which forty or sixty years ago had furnished hogs sufficient to exhaust a whole stud of Arabs in two or three days hunting, are now converted into villages, and even bazaars, teeming with population, or if the jungle, favoured by epidemics, inundations, and the tyranny and incapacity of a native landlord, has been too strong for the plough and the hoe, six heads would now be accounted for instead of thirty. But there are still places which will never be fit for anything but temporary occupation, and which can only yield one crop a year. Far away in Eastern Bengal, on the alluvial flats of some river named after a Hindu divinity, a good line of elephants will now and then turn out quantities of pigs of all sizes, sows with litters, bulky boars and monsters with tusks, in the proportion shown by hares and rabbits during a Norfolk battue. In the south of India and Bombay, long spears are used lance-wise; whereas, on the Bengal side, shorter and heavier spears are jobbed. The shaft of the spear is a male bamboo. Those with the closest joints are the strongest. The best spear heads are manufactured at Salem in the Madras Presidency; shank included, they measure about six or eight inches in length. In selecting them, care must be taken that they have not a shoulder, which will render their withdrawal difficult; and they should be so attached to the shaft as to leave no projecting edge. The Bombay and Deccan spear-shaft is often 10 feet and upwards in length; while that of Bengal does not exceed eight feet. They are both usually shod with lead, to correct the balance, and give them weight. The object of the hunter's ambition is not to slay the boar, but to draw first blood. He who achieves this is said to have taken 'first spear,' and receives the *tushes* as the trophy. It is necessary, of course, to kill the pig; but that is a subsquent consideration. If riding Bombay fashion, as you approach the object of your pursuit, lean slightly forward in your saddle, hold your spear firm, and direct it behind the shoulder; do not push, but ride it in, then, instantaneously withdrawing it, wheel off your horse, and prepare to receive a charge; or, if well backed up, let the others go in at the pig, until you are ready to turn to the action. If you are charged, receive the enemy just where his thick neck buries itself in the shoulder, taking care to get inside the shoulder-blade. If you are riding with the short Bengal spear, wait till the boar's shoulder is parallel with your stirrup, then drop in nigh, behind his withers. One maxim, approved by all hog-hunters of every degree, is that the charge must be met and not awaited. To stand spear in hand, while the boar comes down on you, is to expose yourself and your Arab to be upset, cut and slashed, and ruined for life. A great deal now depends on correctness of aim and lightness of touch. A practised rider puts his horse into a smart canter, bends slightly forward over its right shoulder, and plants the spear as near the spine as possible, before the tusks of his adversary can rip up the forearm or the belly. With a jerk, to which the instincts of the horse respond, he wheels rapidly round to the left, withdrawing his spear if the wound be slight, and leaving it sticking if deep, while the enraged animal is just too late even to graze the horse's hocks. Then, from a determined boar, there may ensue a series of these attacks. The wounded hog sets its back to a bush and rushes out upon one man after another. As many as three spears have been seen lodged in the flanks and ribs, quivering as the hog staggers away under them, until at last it sinks from hæmorrhage, or a fourth spear settles the business. At other times the boar from the very first 'jinks,' as it is technically termed, crosses from right to left under the horse's forelegs, turns 'dung-hill,' refuses to charge, and repeats his tactics so cleverly that the best mounted and most skilled riders are thrown out, and the honour of drawing first blood falls to some second-rate man with a third-rate country-bred horse, who comes up and 'cuts in' just at the very right time. Very rarely a hog has been heard to squeal as the hunter's spear is just about to be delivered, but in such a case it is reasonable to conclude that the fiery blood of the jungle race has been impoverished by connexion with the domestic species; and, on the other hand, a fine specimen of a boar forty inches high, with tusks polished by constant combats or rubbing against trees, refuses to run after less than three hundred yards, turns on the delighted sportsman, gashes one horse, sends another to the right about, and, when pierced through and through, dies in silence, biting hard at the spear shaft or at anything animate or inanimate that comes within its reach."

"Paleface" in the *Asian*, 1880, p. 18, gives an interesting account of how he effected pig-sticking along the Nepaul boundary. He says:—"The way I set about it is—I hunt up the pigs with dogs, and invariably they stand at bay a few moments with the dogs barking. I then ride into the bush, and off we go. A native boy rides a pony, and carries a spare spear, his duty is also to dodge round the other side of grass for a view, if I go into any after a boar. We usually get along very well, but the plains are not big enough for a single spear. When others have been with me, we have done the boars. Three of us killed a boar in the Rajah of Nahan's territory last year between Maijarah and Rampore Mandi. Another on the left bank of the Jumna above Rampore Mandi, and two of us killed one on the Bibiwalla Maidan in the Eastern Dun, and I killed one alone there also. So pig-sticking is possible in the Dhera Dun, and should be made a note of by the inhabitants of, and visitors to that very jolly place. Pig-sticking is a recognised sport near Roorkee, and down on the Ganges Kadir some of the best is to be had. Then all the way along the base of the Himalayas there are places, but the ground is terribly rough. I can find boars, as I say, in plenty, but to kill them is another thing altogether, as in nine cases out of ten they go straight into cover, and whilst they sneak up one nullah you are carefully guarding another. Sometimes you have a bit of luck, and by sleeping already dressed, and getting up before daylight, I have had a good ride occasionally by stealing along a raised bank and seeing a late boar coming home, but then one thing, *viz.*, the fog in the early mornings, makes this game only too often a failure. My pig-sticking this year has consisted of only one boar, and I lost him, but my fruitless rides have been very numerous, and I live in hopes of better days. Inside the forests the pigs are very careful of their skins, and remain in the low hills as a rule; and the few I have found out have always got off, for even the largest plains in the forests are small for pig-sticking, but with a little more experience, and as the weather becomes hotter I hope to account for one or two—even three. The most exciting run I ever had was after a large boar in the Ganges Kadir. I was alone at the time, and he got into the mare four times, making five small cuts, but I bagged him at last with a spear in the brain. I hope Government will find a place for the protection of a few pigs, so that the sport of sports may not die out. I should fancy there are some real A 1 places in the Kumaon Terai for pigs, but I cannot say for certain. I know one or two places in the Garhwal Terai or Babur for real first-class sport, but they are very large to beat and cost a deal of money, and even then with the best of beaters, I doubt many being got out. In all these Babur places the forest is so close that if you disturb pigs in the outlying places, they go into the forests the next day."

"Deer" also, in the columns of the same paper, furnishes a rather interesting account of Pig-sticking in South Purneah. Here of course the beaters were elephants, but besides sticking he shot them too, and as naturally would be the case, was soon taken to task for unsportsmanlike conduct in shooting his pigs and sows in a riding country. "Deer" could not have heard of the "Song of the Boar" which runs—

"The boar, the mighty boar's my theme,
Whate'er the wise may say,
My morning thought, my midnight dream,
My hope throughout the day.
Youth's daring spirit, and manhood's power,
Firm hand and eagle eye,
Must they acquire, who dare aspire,
To see the wild boar die.

Chorus.

Then pledge the boar, the mighty boar,
Fill high the cup for me,
Here's luck to all, who fear no fall,
And the next grey boar we see.

We envy not the rich their wealth,
Nor kings their crowned career,
For our saddle is our throne of wealth,
Our sceptre is the spear.
We rival too the warrior's pride,
Deep stained in crimson gore,
For our field of fame's the jungle side,
And our foe the jungle boar.

When age has weakened manhood's powers,
And every nerve unbraced,
These scenes of joy will still be ours,
On memory's tablet traced.

> And with the friends whom death has spared,
> When youth's wild course is run,
> We'll tell of the dangers we have shared
> And the tushes we have won."

As to the ferocity of the wild boar, the following has been contributed to the *Sporting News* by Capt. Hayes, and extracted by the *Times of India* :—"A pig-sticking friend writes to me from Mainpuri :—'I went out with a friend of mine who keeps a pack of nondescript dogs (about 40), to kill jackals, and roused a big boar. He ran about half a mile through high crops with the dogs yapping after him ; and at last took up his station in a sugar-cane field and would not move. There was another sugar-cane field close by, with an open space four feet wide between. The pig ran backwards and forwards between these two fields for some time, and at last got to the corner of one field with ten dogs yapping round him. Up to this time, he had done nothing in the way of seeking retribution on his followers. But he suddenly got cross and went in and cut six dogs badly, and did what a pig seldom—very seldom does—he charged, cut and passed on, and returned and worried the poor beast he had cut and knocked over.

"'This was going on at the corner of a high sugar-cane field, too high for me to venture into ; but presently a man came up to me with a spear, and said he would see why the pig would not come out. "Go on," I said, "and God be with you." He went in, and half a minute after the boar appeared, sixty yards off, at the top of the opening between the fields and charged straight down at him. He was five yards from me and I shouted to him to clear out of the way, but he pluckily stood and speared the pig in the face. This made the pig wild, and he bucked and raced away with a heavy spear in his face for ten yards, and shook it out ; and to my surprise, turned sharp and came in at the prostate man. I have never seen a pig behave with such savage determination. He tossed the man like a bull and passed on, and returned and tossed him again. At his second return I pressed in and received him on my spear, though I could not hold him off the man. He got in and took the poor creature upon his tusks and shook him in the air. My first spear had gone through the pig, but when I found he took no notice, I jerked about and gave him another deep spear, and then another, but got so tired that I let go—all this time the pig was worrying the man terribly, and I was standing over him. I nipped out, and as soon as I could hold another spear, I went in and rammed it three times again through the pig ; but it was no use ; he went down on his knees and savagely worried the man, and actually killed him under me.

"'When cutting the pig up, I found three spears had gone clean through his lungs, one through his heart, and the last spear had nearly cut the heart in two, yet he was able to worry the man for a good half minute before he died.

CSL

MAMMALIAN GAME

THE GAUR OR BISON

Gavæus Gaurus.

"'I have been at the death of a good 300 pigs, but I never met with such a savage brute. Pigs will charge, cut and pass on; but this brute turned again and again, and dug and tossed at the man like a mad bull, and did not seem to be aware that there was a spear through his vitals.'"

ORDER—RUMINANTIA (PECORA), *Linn.*

Teeth of two or three kinds. Incisors 8 below. Molars 6 on each side in each jaw. Canines more or less developed. Front of upper jaw toothless.

Horn-like prominences of the frontal bone covered with a permanent horny sheath.

Family BOVIDÆ.

Nostrils open, bald within; nose bovine; muffle large, moist. Horns smooth, spreading laterally, cylindrical or depressed, situated on the frontal edge. Skull without sub-orbital pit. Of this family we have—

Bos taurus, *Gray*, the Bull, domesticated throughout India; the Zebu (*Bos Indicus*), or the Humped Ox; the Buffalo (*Bubalus buffelus*), *Gray*, and Gavæus, or the so-called Bisons.

Gen. GAVÆUS.

Massive head, with large concave frontals, surmounted by a ridge or crest of bone; horns flattened on the outer surface, corrugated at the base, and smooth, for two-thirds, or a little more, wide-spreading and recurved at the tips, or absent; hoofs proportionately small and pointed.

Gavæus gaurus (*H. Smith), Jerd., Mam. Ind.* p. 302; *Sterndale, Pop. Hist. Mam. Ind.* p. 481. Bibos aseel, *Horsf., Cat. As. Soc.* p. 24. Bos frontalis (*Lambert*), *Horsf., Cat. As. Soc.* p. 24.

Vern.—Gaor or *Gaori-gai, Bun-boda*, Hindi; *Boda* and *Bun-parra* in the Seonee and Mandla Districts; *Gaoiyo*, Mar.; *Karkoona*, Canarese; *Katuyeni*, Tam.; *Jungle Kulgha*, South Ind.; *Pyoung*, Burm. Horsfield gives the following names under his Bibos Aseel;—*Gayal*, Hindi; *Seboi*, Kuki; *P'hauj* of the Mughs and Burmese, and some others which he considers doubtful.

THE BISON.

Head square, proportionately smaller than in the Ox; the bony frontal ridge 5 inches above the frontal plane; the muzzle large and full; eyes small, pupil pale blue; whole of head in front of eyes covered with a coat of close short hair, of a light greyish brown; below the eyes darker and nearly black; muzzle, with greyish hair, thick and short. Behind the neck, above the shoulder, rises a hump of the same height as the dorsal ridge, which as it goes back terminates about the middle of the back; chest broad; forelegs short, with the joints very short and strong; hair on neck and breast beneath is longer than on the body; the forelegs have a rufous tint behind and laterally above the

CSL

white. The cow has a slender neck, no hump, and the points of the horns do not turn towards each other at the tip; the legs are of a purer white. The very young bull has the forehead narrower than the cow, and the bony frontal ridge scarcely perceptible. The horns too turn more upwards. In old individuals the hair on the upper parts is often worn off. The skin of the under parts when uncovered is deep ochrey yellow.—(*Mammals of India*, p. 302.)

Size—Length—Nose to root of tail, 8 feet 8 inches to 9 ft. 6½ in.

	Ft	In.		Ft.	In.
Length of dorsal ridge,........................	2	5½	to	3	4
Tail, ...	2	10½	„	3	2
Head from muzzle to top of frontal ridge,	2	0	„	2	1¾
Breadth of forehead, ...	1	3½	„	1	4
Circumference of horn at base, ...	1	7½	„	1	8
Distance between the points of the horns,	2	1	„	2	3½

The following are measurements of a bull and cow taken from Campbell's book :—

	Bull.		Cow.	
	Ft.	in.	Ft.	in.
Height at the shoulder........................	6	1	5	5
Height to top of dorsal ridge	6	5	5	10
Length from nose to insertion of tail...	9	0	8	5
Girth of body behind shoulder	8	0	......	
Girth of foreleg, above the knee	2	6	2	0
Girth of neck	4	3	......	
Breadth of forehead	1	3½	......	

From the "Old Shikarry," the following are the dimensions of a bull he shot :—

	Ft.	in.
Perpendicular height from bottom of hoof to top of shoulder (not following curve of body)	6	4
Height to the top of hump	6	9
Length from nose to insertion of tail	11	4
Length of tail..	3	4
Girth of body	9	3
Girth of forearm..	2	10
Girth of neck	4	10
Breadth of forehead	2	5
Circumference of base of horns	1	9
Length of horns..	1	4

Shakespear's largest bison is said to have measured six feet at the shoulder.

Hab.—Forests of India from near Cape Comorin to the foot of the Himalayas. Jerdon says: "On the west coast of India it is abundant all along the Syhadri Range on the western ghauts, both in the forests at the foot of the hills, but more especially in the upland forests and the wooded country

GSL

beyond the crest of the ghauts. The Anamallay Hills, the Neilgherries, Wynaad, Coorg, the Bababooden Hills, the Mahableshwar Hills, are all favourite haunts of this fine animal. North of this it occurs to my own knowledge in the jungles on the Taptee river and the neigbourhood and north of the Nerbudda, a few on the deeper recesses of the Vindhian mountains. On the eastern side of the Peninsula it is found in the Pulney and Dindigul Hills, the Shandamungalum Range, the Shervaroys, and some of the hill ranges near Vellore and the borders of Mysore. North of this the forest being too scanty, it does not occur till the Kistna and Godavery rivers; and hence it is to be found in suitable spots all among the range of Eastern Ghats to near Cuttack and Midnapore, extending west far into Central India and northwards towards the edge of the great plateau which terminates south of the Gangetic Valley. According to Hodgson it also occurs in the Himalayan Terai, probably however, only towards the eastern portion, and here it is rare, for I have spoken to many sportsmen who have hunted in various parts of the Terai, from Sikhim to Rohilcund, and none have ever come across the Gaur at the foot of the Himalayas." (*Mammals of India*, p. 303.) According to Sterndale it is more abundant on the Pachmari and Mahadeo hills. On the east of the Bay of Bengal, it is found from Chittagong through Burmah to the Malayan Peninsula.

Blyth in his *Catalogue of the Mammals of Burmah* says:—"Nowhere does this grand species attain a finer development than in Burmah. Jerdon supposes it to have existed in Ceylon till within the present century. It has not yet been quite decided whether the Gaur, and Gyal or Mithun and the Burmese species are one and the same species, though Mr. Sterndale has described *Gavæus frontalis* as a distinct species as inhabiting the hilly tracts east of the Brahmaputra at the head of the Assam Valley, the Mishmee Hills, in Hill Tipperah, Chittagong and then southwards through Burmah to the hills bordering on the Koladyne river; and *Gavæus sondaicus* as from Pegu, Tenasserim Provinces, Sumatra and Borneo." I cannot find that there are sufficient characters, which are constant, and whch are not common to all, to give them specific rank. Hence I include all under the head of *Gavæus gaurus*. The domestication of *frontalis* may be attributed to the country, and to the natives having a knowledge of their habits, and so interbred their domesticated stock with those which have run wild, and capture many by the aid of fences and allurements. Like the Gaur, the Gyal also go in herds of 20 or more, but the latter are said to be of a milder disposition. Mr. Sterndale has a quotation from *Cassell's Natural History*, concerning the way in which the "Kookies" of the Chittagong Hills catch the wild Gyals—by scattering a number of large balls made of hay, cotton and salt in the direction which they think the animals will take, and after doing this they drive their domesticated herd among the wild ones, which latter, relishing the taste of the balls which are strewn for them, mingle with the tame ones, and in the course of a few weeks, become familiar with the presence of some men who have gradually stolen a march on them, and so associated themselves with their tame cattle and the wild ones too, till they have been able to drive them into their village enclosures." Although it is said the Gyal is of a mild disposition, yet there are records of its charging trespassers in the places they inhabit, in a similar way as the Gaur—especially old solitary bulls. Aberigh-Mackay has an account of the habits of the Gaur in his "Sport in India" in which he says they are found as a general rule to frequent the highest elevations at which food and water is to be found. They pass the day on the tops of the plateau, lying down in secure positions in the wind under the shade of small trees, where they chew the cud and sleep. During the morning and in the evening they bestir themselves in search of food in herds of from 10 to 15, and oftentimes 20 to 30, going about in the small open forest glades, where they find rich grass and young bamboo shoots. In South Behar, in the district of Serjuga, they are also found on the tabular summit of Main Pat. The period of gestation is the same as that of our domestic cow, *viz.*, nine months. November is usually the time the cows calve. During May and a part of June, the old bulls are generally found roaming alone, and it is about this period that they are very dangerous and will not suffer intrusion.

In regard to horns there are numerous contributions in the *Asian*, but I select one given by "Sport" in the Journal mentioned, in July 6, 1880, and another by "Kaati" in the number of November 23rd, 1880. "Sport" gives measurements as below, and he adds that the circumference appears small as compared to those given by Saunderson and other authorities:—

Between tips..	22¾	inches.
From tip to tip, following outside curve and across forehead	6 ft. 9	,,
Between bends, outside greatest width	39½	,,
Ditto inside	33½	,,
Single horn from tip to base, outside curve	33	,,
Circumference	16½	,,

"Kaati" has the following measurements of a bull he shot on the Brahmagiri Hills, which he believes to be the largest ever shot on the Malabar Coast. The measurements are as follows, *viz.* :—

Width across sweep, outside	43½	inches.
Do. do. inside	38½	,,
Length outside curve, left horn	30¾	,,
Do. do. right horn	25½	,,
Do. inside curve, left horn	25½	,,
Do. do. right horn	20¾	,,
Circumference of base (when just killed)	20¼	,,
Ditto, (after 3 years shrinkage)	19½	,,
Width between tips	36¾	,,
Tip to tip, following outside curve and across forehead	70¾	,,

CSL

He says that this Brahmagiri bull was a very old one indeed, his skull being perfectly solid and shewing no sutures at all, except the very broad ones at each side of the nasal bones close under the eye. The coral-like formation of bone on the frontal ridge is wonderfully developed, extending right across from horn to horn, and averaging two inches in breadth and $\frac{5}{8}$ inch in height; the right horn unfortunately is much worn away and broken at the tip, and as it is more than five inches shorter than the left horn, I suppose that quite that length must have been worn away.

I add another measurement of "M. S. K.'s" contributed to the *Asian* (July 20th 1880):—

Between tips	$24\frac{1}{2}$ inches.
Tip to tip outside curve and across head	$7\frac{1}{4}$ feet.
Across bend at greatest width outside	$43\frac{1}{2}$ inches.
Do. do. inside	$34\frac{3}{4}$,,

NEXT in order comes the Yak or *Pœphagus grunniens*, known in Tibet as the Boobul, Soora-Guy or Dong, and in Hindi as the Bun Chowr. It can scarcely be included in the Mammalian fauna of British India, being an inhabitant of the high regions of Tibet and Ladak, the Valley of the Chang Chennoo and the slopes of the Karakoram mountains. (*Kinloch.*) According to Hodgson, it inhabits all the loftiest plateaux of high Asia betwen the Altoi and the Himalaya, the Belurtagh and the Peling Mountains. In Eastern Turkestan and Badakshan it is domesticated, and is highly appreciated as a beast of burthen. From the Indian Ox, it differs in having no dewlap or mane, nor any hump; the horns are placed far apart. It is entirely black in colour, and is covered on the neck, shoulders, back and sides with short soft hair; on the median part of the abdomen, over the thighs and the anterior part of the neck below and sides of the extremities, the hair is long, pendulous and shining black. Its height is from about 42 to 46 inches; the body is scarcely 8 or 10 inches from the ground, which may be said to be swept with the long hair that streams from the forelegs and that part where the dewlap is situated in the oxen. The calves are said to be covered with black curled hair, and they do not obtain the long ones till after the third month. As beasts of burthen, they are eulogized as sagacious and sure-footed and extremely obedient. In their wild state they are found in ravines and very inaccessible places; both their sense of sight and smell are keen; they herd together in great numbers, and when grazing do so from a lower to a higher level, and so giving them some force to furrow their noses through the snow for herbage.

Gen. BUBALUS.

Horns large, depressed, subtrigonal at the base, attached to the highest line of the frontals, inclining upwards and backward, conical towards the tip and bending upwards; muzzle large; no hump or dorsal ridge; hoofs large.

CSL

Bubalus arni (*Kerr), Jerd., Mamm. Ind* p. 306; *Sterndale, Mam. of Ind.* (*Asian*, 1882, p. 15); *id., Pop. Nat Hist Mam.* p. 490.

Vern.—Arna (male), *Arni* (female); *Jungli Bhains*, Hind.

THE WILD BUFFALO.

In every respect, like the common domesticated species, but about at least one-third larger, and vastly superior in strength.

A male is generally about 19 hands at the shoulder, and in length from tip of nose to root of tail from 9½ to 10½ feet; the tail only reaches to the hock. The horns are very large, and there are records of these attaining from 3½ feet to 6 feet; the usual size may be said to be 4½ feet. There is a specimen, it is said, in the British Museum, that measures 12 feet 2 inches round both horns above the forehead and another about 14 feet round the outer curve. Meade Shell in the *Asian* of July 20, 1880, gives measurements of one in his possession as under:—

	Ft.	in.
Between tips...	3	7½
Tip to tip outside curve and across head	9	8
Across bends at greatest width outside	4	11
do do inside....................	4	3½
Single horn tip to base outside curve	4	4½
Circumference at base of horn	1	6

Hab.—The swampy Terai at the foot of the hills from Oudh to Bhootan in the plains of Lower Bengal as far west as Tirhoot in Assam and in Burmah, also in Central India from Midnapore to Raipore, from thence nearly to the Godavery; also in Ceylon.

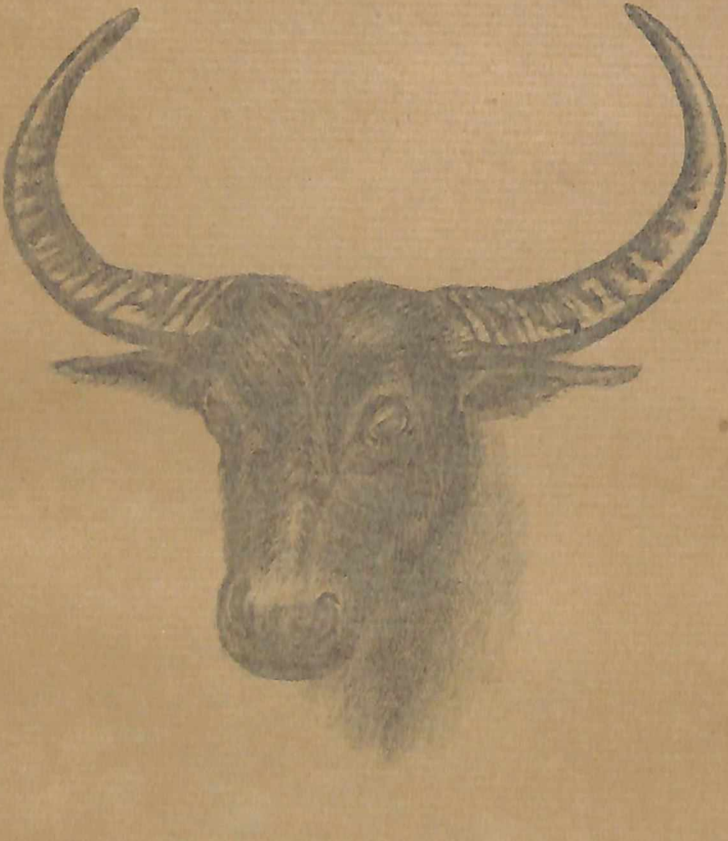
The Wild Buffalo inhabits low and swampy ground and open grass plains. They live in large herds, and the females produce in the summer months from one to two young. The period of gestation is about 10 months. They feed generally in the early mornings and at night, and often make great havoc in the extensive rice fields. In the Central Provinces they are found in the Sal forests and in the swampy plains where the long rank grass affords them both food and cover. There is not much written of this ungainly animal, as though swift when pressed, except for the horns as a trophy, neither the skin nor the flesh are desirable. The natives however eat the flesh, which to the European palate is insipid, and the idea of making a meal off a buffalo steak almost revolting.

Family HELEOTRAGIDÆ,—TRUE ANTELOPES.

Nostrils bald within, open; nose bovine; muffle large, naked, moist; crumen distinct or rudimentary; horns conical, annulated, rarely present in females.

CSL

MAMMALIAN GAME

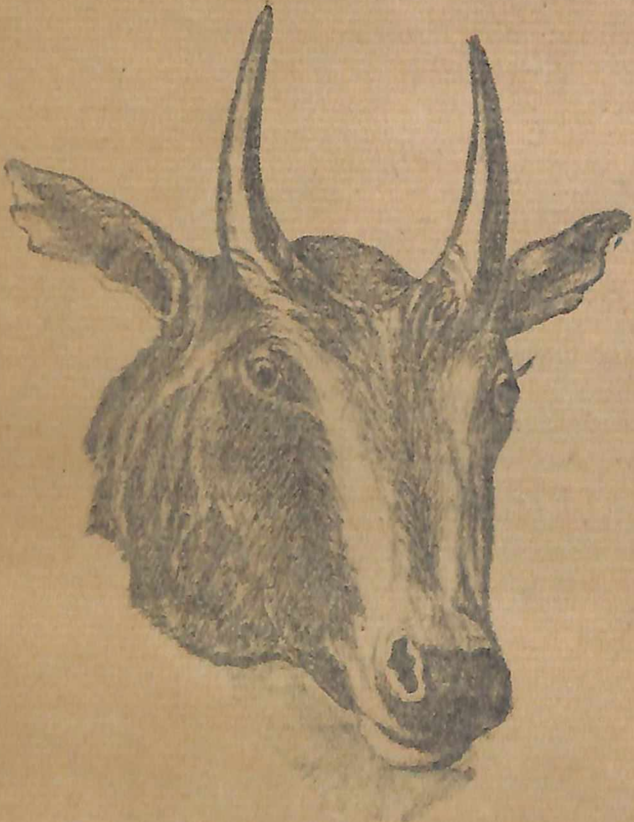


BUFFALO BULL

Bübălüs Arni

CSL

MAMMALIAN GAME



NILGHAI OR BLUE BULL

Portax Pictus

CSL

Tetracerus.—Horns, in the males only, four. Front pair very short, Sub-orbital fossæ large, shallow ; feet pits in the hind feet only. Mammæ four.

Tetracerus quadricornis, *Blainv., Gray, Cat. Ungul. Br. Mus.* p. 68 ; *Cat. Rum. Mam.* p. 18 ; *Jerd., Mam. Ind.* p. 274 ; *Murray, Hdbk., Zool., &c., Sind.* ; *Sterndale, Pop. Hist. Mam.* p. 479.

Vern.—*Chowsinghee*, Sind, Hind.

THE FOUR-HORNED ANTELOPE.

Uniform brownish bay above, lighter beneath. Middle of belly and inside of limbs white, forelegs dark. Muzzle and edge of the ears with long hairs. Upper pair of horns about 3 inches long, smooth, black, pointed, erected and bending slightly forward. The additional pair in front are between the orbits, from ½ to ¾ of an inch in length, blunt and erect.

Length.—Head and body 38 to 42 inches ; tail 5 to 6 inches ; height at shoulder two feet or more.

Hab—Nearly throughout India. Abounds in the hills of the Eastern Ghauts from near Madras northwards. Found in Rajputana in the Aravelli range. In Sind and the Punjab it occurs, but is exceedingly rare. It is said not to be known in Bengal, nor in Burmah and Ceylon.

The four-horned Antelope is a very shy animal, and very wary. It is very difficult to procure specimens, owing to its inhabiting thick bamboo jungle, and edges of forests covered with large bushes. Its diminutive size adds to the difficulty, as the bushes they frequent are thick and much higher than the animal. It is not an animal much sought for, even as food, though the Bheels think it equal to mutton.

Gen. PORTAX.

Horns on back edge of frontal bone behind the orbit, short, recurved, conical and smooth, angular at the base ; small eye-pits ; hind legs shorter than the front ; the neck with a short upright mane ; throat of the male with a long tuft of black hair.

Portax pictus (*Pall.*), *Jerd., Mam. Ind.* p. 272 ; *Sterndale, Pop. Hist. Mam.* p. 476.

Vern.—*Nilgao*, *Nilgai* or *Lilgai*, *Rorja* or *Rojh*, *Rooi* (female), Hind. ; *Guraya*, Gondi ; *Maravi*, Canarese ; *Manupottu*, Telegu.

THE NYLGAO OR BLUE BULL.

Head long and flat ; face long and narrow ; neck long and compressed ; withers high ; hind quarters lower than in front. Male of an iron gray or uniform slaty blue colour ; inside of ears, lips, and chin white ; a large white patch

CSL

on the throat, below which is a tuft of long black hairs; the chest, stomach and rings on the fetlocks white; mane, throat tuft and tip of tail black.

The female is sandy or tawny, and is somewhat smaller than the male.

Size.—Length of male—6½ to 7 feet; tail 18 to 20 inches; height at shoulder, from 13 to 14½ hands; horns, from 8 to 10 inches long, nearly parallel throughout their whole length, smooth, pointed, and slightly curved forward.

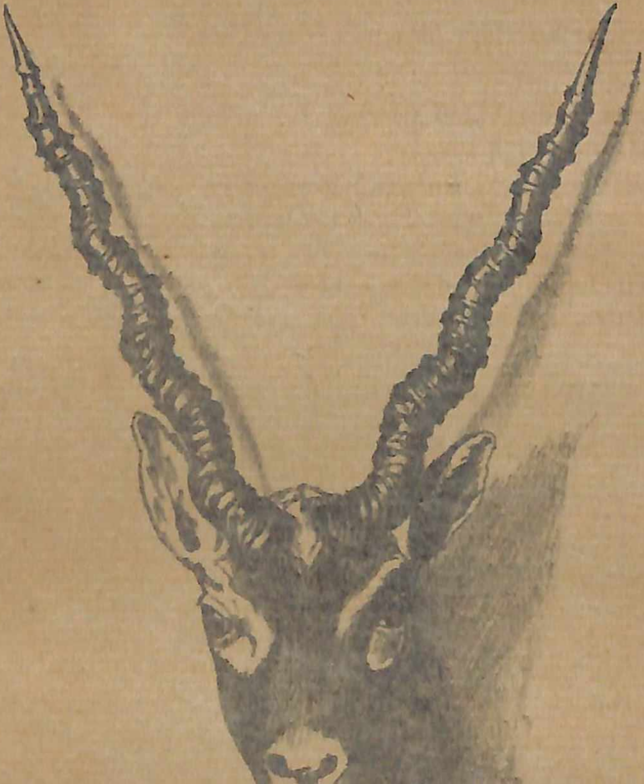
Hab.—India generally, from the Himalayas to the south. It is not common south of the Ganges, nor, according to Jerdon, is it found in the extreme south of India.

The Nylghai generally affects open country or lands intermediate between jungle and cultivation, where there is plenty of scrub or scanty tree jungle. It is extremely fond of the small *Zizyphus* or Beyr shrubs, and it is said that even the bitter *Phyllanthus emblica* or Ownla is greedily eaten by it. It can scarcely be reckoned a game animal, as the usual way of encompassing its death is by either running it down and shooting it with a pistol or carbine, or spearing it. A good horse is all that is necessary. Distance pot shooting is not however infrequent.

My friend, Mr. A. W. Morris, F. Z. S., of Bangalore, has very kindly sent me the following notes as affecting the Nylghai inhabiting the Salem districts. He says: "Found in several parts of the Salem District and other parts of the Madras Presidency, on low hills covered with brushwood, or in plain open country with scattered bushes, in parties of 7,10 or more individuals, feeding on the tender shoots and branches of the trees around them. They are difficult to get as their sense of hearing is acute, and the least noise is sufficient to put them on the *qui vive*. When alarmed they have an ungainly slouching gallop, which they can keep up for a considerable time without feeling done. Of all the ruminants this seems to be one of the most irascible, as almost any thing is sufficient to irritate and vex it. A male in the Government Gardens at Bangalore was so belligerent that no sooner did it see a person approach, than it got vicious, and with eyes rolling, ears thrown back, and in an attitude that betokened rage, it would make for him and attempt to butt through the rails; even should the object that raised its ire pass on quietly, it would not allow him to go unchallenged, but would keep on along the rails making a feint now and again. Perhaps no animal is so little sought after, owing to the flesh being tough and tasteless, but the marrow bones and tongue are said to be delicious. Tenacious of life, it is reported to take a big shot and make off without appearing any the worse for it, and my own experience coincides with this statement." The Nylghai rests during the day in shade, but is less of a nocturnal feeder than the Sambar Stag. Sterndale says he has found Nylghai feeding at all times of the day. The droppings are usually found in one place. The Nylghai drinks daily, the Sambar only every third day, and many are shot over water. Although he is such an imposing animal, the Blue Bull is but poor shooting, unless when

CSL

MAMMALIAN GAME



INDIAN ANTELOPE

Antilope Bezoartica.

CSL

fairly run down in the open. With a sharp spurt he is easily blown, but if not pressed, will gallop for ever. He adds that it is the only one of the deer and antelope of India that could be turned to any useful purpose. He had one in his collection of animals which was trained, not to saddle, for such a thing would not stay on his back, but to saddle cloth.

Gen. ANTELOPE.

Horns in the male only; no muffle; suborbital sinus linear; no canines; groin-pits large; feet-pits present; suborbital fossa of skull large.

Antelope bezoartica (*Aldr.*), *Jerd.*, *Mam. Ind.* p. 275; *Sterndale*, *Pop. Nat Hist. Mam.* p. 472.

Vern.—Mrigor, *Mirga*, Sanscrit; *Harna*, *Hirun*, *Harin* (male), and *Hirni* (female), Hindi; also *Kahvit*, Hindi; according to Jerdon, *Goria* (female), and *Behar*; *Bureta*, in Bhagulpore; *Barout* and *Sasin*, in Nepal; *Phandayet*, Mahratti; (Jerdon) *Kirn* and *Bamuni Hiru*, Mahratti; *Chigri*, Canarese; *Irri* (male), *Sedi* (female), and *Janka*, Telegu; *Alali* (male) and *Gaddali* (female) of Baoris.

THE INDIAN ANTELOPE OR BLACK BUCK.

Head with long spiral, and closely annulated horns, the tips diverging in a V-form; flexures in the horn four or five, perfectly round, tapering gradually to the tips, which are smooth. The colour of old males deep blackish brown, the back and side with an abrupt line of separation from the white of the belly; the dark colour also extends down the outer surface of the limbs; back of the head, nape and neck hoary yellowish, under parts and inside of limbs pure white; face black with a white circle round the eyes and nose; tail short; young males fawn-coloured. The females are hornless, somewhat smaller and pale yellowish fawn above, white below, with a pale streak from the shoulder to the haunch.

Length.—About 4 feet to root of tail; tail 7 inches; height at shoulder 32 inches. Horns average in length from 20 inches to 24 to 26 inches.

Hab.—In open plain country throughout India, except in Lower Bengal and Malabar. Is found in the Punjab and also in the Deccan, North-West Provinces, Central Provinces, Assam, and Burmah. Of this Antelope scarcely anything need be said here, since it is one so well known throughout India, and one which every sportsman seeks in his shikar trip, unless he is specially out after large game. Its habits are so well known. Like the gazelles they herd in twenties and thirties, and are famous for their high leaps and bounds as well as their fleetness. The bucks, as is generally known, bring up the rear of their herd, and in the case of fawns, instances are on record that in some way they make them lie down in a place of hiding when unable to keep up with the herd or likely to be taken. Jerdon in his "Mammals of India," p. 278, says

GSL

that when a herd goes away on the approach of danger, if any of the does are lingering behind, the buck comes up and drives them off after the others, acting as whipper-in, and never allowing one to drop behind. Bucks may often be seen fighting, and are then so intently engaged, their heads often locked together by the horns, that they may be approached very close before the common danger causes them to separate. Bucks with broken horns caused by fights are often met with, and I have heard of bucks being sometimes caught by nooses being attached to the horns of a tame one. I have twice seen a wounded antelope pursued by greyhounds drop suddenly into a small ravine, and lie close to the ground, allowing the dogs to pass over without noticing it, and hurry forward. They breed generally about spring-time. Williamson in his "Wild Sports of the East" says that he has seen a buck lead a herd over a net at least 11 feet high, and that they bound to a height of from 12 to 13 feet, and pass over 10 or 12 yards at a single bound. Their extreme wariness and the open nature of the country they frequent, render it difficult to stalk them. Some *ruse* must be practiced. The sportsman must move along, in or under cover of a country cart, or putting the brown blanket of the country over his head, he must walk beside a buffalo after the manner of the harmless villager, or he may travel incognito on a camel, from which bells and all bright saddlery have been carefully removed. Of this sport, Shakespear writes as follows:—

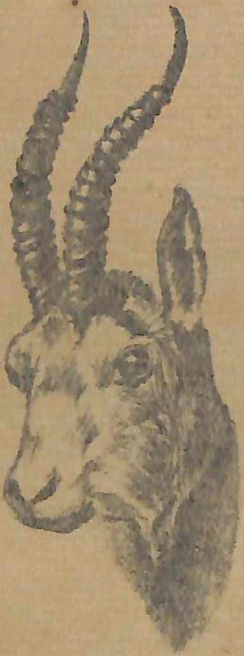
"Antelope shooting requires much patience, and good shooting. If you shoot with very heavy rifles, you will find it advisible to have a tripod rest with you. When antelope are much fired at they will not let the hunter come within 180 or 200 yards; and though the mark is not very small, the walking in the sun, and stalking and stooping, make one unsteady. The secret of following antelope is to move towards the head of the herd, which in this way continually circles round you. By degrees you get nearer and nearer. The flesh is good if kept a couple of days or more, which can be easily done at all seasons but the hottest."

"Triangle" in the *Asian* of March 30, 1880, says that of the several thousands of Black Bucks he killed in the North-West Provinces, Rajputana and the Punjab he got only one pair of horns which measured 26¼ inches in length and only 5 over 25 inches. 28 inches, he says, is the longest he has seen recorded. "Yuba Bill" in the same paper (13th April 1880) gives 26 inches as his biggest horns from Hissar.

"Longshanks" also has had his 26 inch horn. "Rohilla," *Asian*, 27th April, 1880, affirms that Captain Blood's Buck horns were just under and not over 28 inches as "Triangle" stated.

"Gangootre Shikaree," at Mussoorie, in *Asian* of 27th April, 1880, invites any one to see the gigantic horns he has measuring 30¾ inches. As to the controversy of the length of horns, it appears 30¾ inches is about the longest on

MAMMALIAN GAME



THIBETAN GAZELLE

Gazella Picticaudata

GSL

MAMMALIAN GAME

INDIAN GAZELLE

Gazella Bennettii

CSL

record. The average is 26 inches; horns above this length may be said to be rare.

The next animal to follow in sequence is *Panthalops Hodgsoni*, which is not an inhabitant of British India, but of the plains of Tibet. It is altogether a rare animal, and even its position among the Antelopes is doubtful. It is said to exceed in size the Black Buck or Indian Antelope. According to Kinloch its colour is a reddish fawn, verging on white in very old individuals, a dark stripe runs down the shoulders and flanks, and the legs are dark brown, the face is nearly black; the hair is long and brittle and of extraordinary thickness. Muffle thick and puffed, and there is a small rudimentary beard; horns black, 23—24 inches in length. Females are hornless.

Gen. GAZELLA.

Nostrils open, bald within; nose bovine, narrow, simple; crumen distinct; false hoofs well developed; horns moderate or small, annulated, lyrate or non-lyrate, curved slightly backwards. Females with small smooth horns, or hornless. The skull has an anteorbital vacuity with a small anteorbital fossa; nose aperture moderate; inter maxillares generally reaching to the nasals; auditory bullæ large; eye pits small; groin pits distinct; no dorsal streak; knees tufted.

These are animals of slender make and graceful form. In all the species, there is a white band running down from the base of the horns to the muzzle, the intermediate space being of a darker colour than the sides of the face, and forming an almost triangular patch.

Gazella Bennetti, *Sykes, Jerdon, Mam. Ind.* p. 280; *Murray, Handb. Zoöl., &c., Sind*, p. 97; *id., Vert. Zool. Sind.* p. 56; *Sterndale, Mam. Ind. Asian*, p. 137, 1882; *id., Pop. Hist. Mam.* p. 463.

Vern.—Chinkara, Hind; *Kal Sipi*, Mahr.; *Hirni*, Punj.; *Mudari*, Canarese.

THE CHINKARA OR INDIAN GAZELLE, COMMONLY MISCALLED RAVINE DEER.

Colour above deep fawn brown; darker where it joins the white of the sides and buttocks; chin, breast, lower parts and buttock behind white; tail, knee tufts and fetlocks black; a dark brown patch on the nose, and a dark line from the eyes to the nose bordered by a white line above.

Length.—Head and body of adult male, 38 to 44 inches; tail, 8 to 9 inches; height, 26 to 28 inches. Horns, 12 to 13 inches. In the Kurrachee Museum is a pair 14½ inches. As a rule the Sind form has the tips of the horns curved forward; horns of females 4 to 6 inches.

Hab.—Sind, Punjab, N.-W. Provinces, Kathiawar, Guzerat, Central India and the Berars; also Kutch, Rajputana and Hurrianæ. In the Deccan it is

CSL

common, but not in the lowlands of the Concan, nor on the Malabar Coast. In Sind it is numerous on the low undulating hills, also on the Pubb range, where it is usually met with not far from the domains of *Ovis cycloceros.*

Though this is called the "Ravine deer" it is certainly not a deer. It frequents broken ground where there is plenty of scrub, especially in the intervening sandy nullahs of undulating hills or hillocks, where it feeds on the Beyr or small *Zizyphus* scrub, Acacias, and in the vicinity of water on Ranunculi and a small grass belonging to the *Scirpus* group. It is a very wary animal, and when feeding is always on the alert, almost every minute raising its head to look round. It is less afraid of man, than of jackals and wolves; the latter especially, of which a pack of two or more in Sind are sufficient to seize one. To sportsmen, it gives not a little trouble, as it is when feeding almost constantly on the move. In the nullahs or ravines, they are very watchful, and once alarmed, they are off like lightning, and stop at about 200 or 300 yards on some eminence, whence a sight could be had of the cause of their alarm. They are seldom in herds of more than ten, often however singly, and if two or less than five, they feed very much scattered, at least from 20 to 30 yards (from one) another. Their sense of smell is very acute, and hence going to the windward of them should be avoided. Stalking them is very difficult, especially as they elude observation in the nullahs in a very remarkable manner. On open ground one could get within shot by having a bullock, or a cultivator with a load of grass on his head to walk beside of. In the Punjab and the N.-W. Provinces, also in the upper parts of Sind, hawks are used in hunting this graceful creature; while the hawks are confusing the creature by continual attacks on the head and eyes, dogs are let loose to seize it.

This is the only Gazelle which comes within the scope of this work. The other species are *G. fuscifrons*, which is found in Seistan; *G. subgutturosa* in Persia, and *G. picticauda* in Tibet.

The next group of animals is what may be correctly termed Goat Antelopes, called by some Capricorns. It includes the genera *Budorcas* and *Nemorhædus.* Of the first we have *Budorcas taxicolor*, of which very little is known. It inhabits the Mishmee Hills, Assam and Tibet, where it is called the Tah-kin or Tah-koon.

It can scarcely be called a game animal, and there appears nothing on record in regard to the shooting of it as such. It is said to be "a large heavily built ruminant) about 3 feet 6 inches high at the shoulder and 6 feet in total length. It is cow-shaped somewhat, with curiously bent horns in both sexes, which spring upwards and backwards with angular curves; the chevron is highly arched, and the false hoofs are very large and obtusely conical, about 2½ inches or more in length. The colour is fulvous throughout, some of the hairs being dark tipped. Legs, tail, muzzle and dorsal stripe black.

Gen. NEMORHÆDUS.

Horns in both sexes, round black and ringed; muffle small; eye-pits small; feet-pits large; tail short, hairy; mammæ, four. (*Jerd.*)

Nemorhædus bubalina (*Hodgs.*), *Jerd. Mam. Ind.* p. 283; *McMaster, Notes Nat. Hist. Calc. Journ.* p. 143; *Kinloch, Large Game of Tibet*, p. 27; *Cassell's Natural Hist. Mammalia*; *Sterndale, Mam. Ind. Asian*, p. 123, *Jan.* 31st, 1880; *id., Pop. Nat. Hist. Mam.* p. 454.

Vern.—Serow, Pahari, Salaphir, Kashmiri; *Shanli*, Burmo-Chinese.

THE SEROW OR FOREST GOAT.

Horns stout at base, ringed nearly to the tips, and curved backward close to the neck; in length they are from 9 to 14 inches, and very sharp and pointed. Body covered with thick coarse hair; very bristly and forming something like a mane on the neck and shoulders; ears large; muzzle with two orifices below the eyes. Colour dull black above, bright red on the sides, and white underneath; legs dirty white. Both sexes horned. Height 3 feet. Length 5 to 5½ feet.

Hab.—The wooded range of the Himalayas from Kashmir down past Sikkim on to the ranges dividing China from Burmah. (*Stern.*)

This is said to be "an ungainly-looking animal, combining the characteristics of the cow, the donkey, the pig and the goat. It has an awkward gait, but in spite of this it can go over the worst ground, and it has perhaps no superior in going down stee phills. In Cassell's "Natural History" Prof. Garrod quotes Kinloch to a great extent in regard to the habits of the Serow Goat. The extract says that "it is a solitary animal and is nowhere numerous; two or three may be found on one hill, four or five on another, and so on. It delights in the steepest and most rocky hill-sides, and its favourite resting places are in caves under the shelter of overhanging rocks or at the foot of shady trees. It constantly repairs to the same spots, as testified to by the large heaps of its droppings which are to be found in such localities. Although very shy, and difficult to find, the Serow is a fierce and dangerous brute when wounded and brought to bay. I have even heard of an unwounded male charging when his mate had been shot." Dr Anderson found it in the Western Provinces of Yunnan. General MacMaster in his notes says that even in its exhausted and dying state, one under his notice was exceedingly savage, butting at every one who approached it. The female is said usually to produce one kid in the autumn about September or October; the period of gestation is seven months. In the "Sportsman's Guide to Cashmere and Ladak," the writer says that the Serow can be found with comparative ease in the winter months in the Sindh Valley. For choice of localities he gives the rocks over Oovraposh, the Kutchumbal and about one mile beyond Akahal, Marmar or Koolan. Kumaon, the Ganges Valley, and Badhraj above Dehra Dun are localities whence specimens have been shot. In the outer ranges of Kashmir it is said to be more plentiful.

Nemorhædus goral, *Hardw., Tr. Lin Soc.* xiv. p. 518; *Kinloch, Large Game of Tibet; Jerdon, Mam. Ind.* p. 285; *Sterndale, Mam. Br. Ind. Asian, Jan.* 31, p. 123, 1882; *id., Pop. Hist. Mam. Ind.* p. 557.

Vern.—Goral, Pahari, Pyur, Rein or *Rom*, Kashmiri; *Ragiyu* Bhotia.

THE SMALL HIMALAYAN CAPRICORN OR FOREST GOAT.

Head with the horns springing from the top of the frontals, inclining backwards and slightly curved, ringed at the base to nearly one-half or more, generally the apical third or more smooth, and the tip sharp-pointed. Colour dull brownish grey above, with a dark mesial line, paler below; a large white spot under the throat; chest and front of forelegs dark brown. Length about 4 feet; height 28 to 30 inches; horns 6 to 9 inches.

Hab.—Of this animal also we have not much information. It is said to range over a great extent of Himalayan country, and is the best known of all the hill game. It is found from Assam and Sikkim to Kashmir, according to Jerdon. In the "Sportsman's Guide to Kashmir," the writer says it is to be found in Budrawar, Kistwar and in the Pir Pinjal, but no one would journey to Kashmir to shoot Gooral. In the Siwalek range they are to be found in great numbers, and some fine specimens are to be obtained there. Localities whence specimens were obtained, and the length of their horns are as under:—

Gurhwal,	horns	7½	inches.
Siwaliks,	„	7½	„
Kumaon,	„	8	„
Bussahir,	„	8	„

Besides these, there are noted a few horns over 7 inches which the writer says came from the vicinity of Simla and other hill stations. The longest female horns are 5 inches. Gooral stalking, he says, is very pretty sport, and is excellent practice both as regards walking and shooting. The Gooral is not gregarious, although several may be found scattered over one hill-side. Kinloch says they are to to be found in all sorts of ground from bare crags to thick undulating forest; but their favorite resorts are steep rocky hills, thinly sprinkled with forest, especially where it consists of the Kolin pine. They feed only in the morning and evening, and in cloudy weather during the day also. Kinloch adds that from constantly seeing shepherds and woodcutters; and from living so near human habitations, Gooral are not alarmed easily, and where the ground is much broken up they are not difficult to stalk. The best way to hunt them, he says, is to be on the ground by daylight, and work along the face of the hill which may be selected, keeping as high as possible. Every slope should be carefully examined, and on reaching the edge of each ravine it should be thoroughly reconnoitred. Being good climbers, Gooral are to be found in all sorts of places in the ravine. The following is an extract from the *Asian* of

CSL

31st January 1882, by "Jungle Tracks," which is chiefly interesting as affording information regarding the habits of this animal.

He says: "There are few sportsmen, I fancy, who have shot in the Himalayas, who cannot recall to mind many a pleasant day spent in stalking the commonest of our hill deer (excuse the misnomer), the Gooral. It is generally the first kind of 'shikar' that falls to the rifle of the European sportsman as he wends his way up to higher altitudes in search of the more uncommon varieties, such as the markhor, ibex, &c.

"The first Gooral I ever shot was in 1866. Never shall I forget that little epsiode I had discovered there were some Gooral on a certain hill not far from my bungalow, but all my attempts at stalking them proved fruitless.

"Many a sleepless night I passed thinking how I could circumvent the little beggars, and at last an idea (rather an unsportsmanlike one I fear, but I was a young hand then) struck me 'all of a heap,' and I determined to carry it forthwith into execution. This was to conceal myself behind a rock and await the appearance of the Gooral at sunrise, as I had noticed, that as the sun rose, they came out of the wet grass and stood motionless on some rock basking in the rising sun; this only lasted for about half an hour, when they scattered about grazing.

"Accordingly, one morning I found myself on the ground before daybreak, and, having a very good knowledge of the particular rocks frequented by the Gooral, concealed myself at a convenient distance from one of these rocks. It was a horribly cold morning, but the thought of soon having a shot enabled me to bear up with the inconvenience. Gradually it became daylight, and then the first faint streaks of sunlight began to appear, and, soon after, the sun rose in all his glory. My excitement now became tremendous, and I began squinting about all over the place in the hope of seeing Gooral. I was a young hand at shikar in those days, and used to work myself into an unnecessary state of excitement. All of a sudden I became aware of a Gooral standing on the rock right in front of me. How or when he got there I never could tell; he seemed to have sprung up like a 'Jack in the box.' My rifle was all ready to receive him, and had, in fact, been so far the last hour. Carefully resting it on the rock behind which I sat, and bringing the sights to bear, I gently pressed the trigger and down fell the Gooral stone dead. I rushed forward, and for the first time had the satisfaction of gazing on a Gooral at close quarters.

"He was fortunately a male with horns 7 inches, though when I was firing at him I never troubled myself to think about the sex it might be. Since then many are the Goorals I have bagged, but none of these gave me the same amount of pleasure as did my first.

"Gooral are generally to be found not far from our different hill stations, and a very jolly two or three days' holidays may be enjoyed in hunting them. It is, moreover, capital practice, and keeps you in good form both for walking and shooting, as the ground they inhabit is just sufficiently difficult to keep

CSL

your head and nerves up to the proper mark. There is nothing one loses sooner than one's walking powers, and steadiness of hand and nerve from want of practice. The station of Dharmsala is the best I know for this sort of thing. Gooral are to be found on the hills behind the station, only an hour's walk from your bungalow, and yet residents who have been there for years were surprised when I told them of it, but still they never went; so much the better for me—I had the Gooral all to myself, and many a pleasant day I enjoyed stalking them. Last December twelve months, and just a few days before Xmas, having nothing particular to do, I took up the rifle and went off for a ramble in the snow towards the Gooral ground. Shortly after my departure it began to snow, and by the time I reached the Gooral ground it was snowing hard, and I was just meditating a return home, when I suddenly came upon no less than five Gooral grazing on the hill opposite under shelter of some large rocks and a precipice, where there was no snow owing to the sheltered nature of the ground. They were about a hundred yards off, and, though I could have got nearer, I am afraid was too lazy to attempt it, so sat down and tried to have a shot. I say tried, advisedly, as it was some time before I could fire, owing to the snow, which was now falling in large heavy flakes, completely obscuring my sights the moment I raised the rifle. I lost all patience at last, and picking out what I thought looked like a male (for I declare I could see no difference between them) I fired rather a hasty shot. A clean miss was the result, and away bounded the Gooral in all directions, but they soon all got together again, except one unfortunate creature which seemed to us (my shikarie, breakfast cooly, and self) to have got into rather a mess in the deep snow, and appeared to make way with the greatest difficulty. It suddenly occurred to us to try and make a capture. We therefore surrounded the poor creature and with shouts and yells closed in on it. The row we made seemed to utterly flabbergast it; it gave a few more desperate plunges and then collapsed, and the next moment we had seized and secured it. She turned out to be a female in kid, and the look of terror in her face was piteous in the extreme. Just like niggers they were for walking her off home, and slaughtering her, and certainly thought me demented when I told them I was going to let her go again. I had no pencil, or card, or string, conveniently at hand to place a brief history of the capture round her throat, so tore one side of my handkerchief off, and tying it round her neck had her carried out of the snow-drift into which she had in her fright rushed, and then let her go. Away she rushed and was soon out of sight. After this little lark I returned home. Strange to say, I had never again seen this female Gooral, though I have paid several visits since to that ground. What I like best of all is, going after these Gooral all by myself. I enjoy it a thousand times more than if I had a native with me. There is an irresistible charm in feeling yourself all alone in the jungle and on the mountain side. I feel as if I was a different being, and can walk better, climb better, and stalk ever so much better than if I had any one with me. Then when you have

CSL

successfully stalked and bagged your Gooral, I like to carry him home slung on my back. Of course, the natives can't understand it, and think me an awful ass, and I daresay some of your readers will think the same; but just let them try it, and they will be surprised to find how their heart warms to it, especially the 'pucca' ones; I have always done so whenever practicable from my earliest shikar days. It is only after such animals as ibex, markhor, &c., whose haunts one knows nothing of, that a shikaree is indispensable, otherwise they are a nuisance and only in one's way I think. In the plains, as soon as I had made myself acquainted with the various shooting grounds, I never took a shikaree out with me. The consequence was that being by myself I had to think for myself, and act for myself, and believe me this teaches you more in the art of stalking and woodcraft generally than you would learn in a century by always being dependent on your shikaree But to return to the Goorals.

"Another capital place to find Gooral is Kannyara, where the State quarries are. Kannyara is only about seven or eight miles from Dharmsala. It is my pet place and always a sure find. Many a glorious day have I spent there in stalking the Gooral. One afternoon I made a very pretty bag of three Gooral, two males and a female (it should be borne in mind that the female was not shot intentionally, that is, it was not fired at knowing it to be a female, as it is almost impossible to distinguish male from female); but to resume: there had been a slight shower of rain while I was upon the hills, and I had taken shelter under some large overhanging rocks, and having lighted my pipe was enjoying a quiet smoke, when I perceived two Goorals come out and commence grazing on the hill opposite. As was my custom I was alone, so sat quietly smoking, and at the same time thinking for myself what would be my best place to get a shot. There was no hurry or flurry, no whisperings, or moving about, or throwing about of arms, which certainly would have been the case if I had a native with me. Well, I decided to wait and see if the Gooral would take any decided direction. For a long time they did not, but at last they gradually grazed down the hill. Ah! thought I, they are making for the water below. I waited, and soon they were out of sight. I then stalked down to about opposite where I had last seen them, and took a cautious peep over the rock behind which I was concealed. There were my little friends at the stream drinking. Now, thought I, if they graze up towards me I have got them, or if they return to where I saw them first (the more likely of the two) I still have them, as the hill opposite was not more than sixty yards across. As I had anticipated, they grazed back towards the latter place, and soon offered fair shots. Slipping my puttoo hat on to the rocks in front of me, and resting the rifle on it, I took a cool and steady shot. The bullet sped true to its mark and down rolled the Gooral; the left barrel very neatly pinked off the other as it went bounding along up the hill, and down it rolled also; they turned out to

MINISTRY OF CULTURE · GOVERNMENT OF INDIA
GSL

be a male and female. After disembowelling them I carried them up to the spot I had fired from, and then putting my finger and thumb into my mouth, sent one of those shrill drawling 'Pahari' whistles down to my camp, which could be seen in the gorge below. My servants knew this was a signal for assistance, and as soon as my whistle was acknowledged by another from below, I left the two Goorals and went up the hills to have a look round, as I knew the coolies would not be up for some time, and I had plenty of day-light before me yet. I soon saw another Gooral, but before going after him, I went back to the two I had left, and found the coolies not far off, so making the animals over to them, and sending them off, I started for the other gooral I had seen. A little careful stalking soon brought me up, when a careful shot tumbled him over dead. He turned out a very fine old male, with 8 inch horns, the best I have ever shot. Having disembowelled him, I strapped him on to my back, and lighting my pipe trudged down to camp.

"The horns of the male gooral can be converted into very pretty 'muffineers' by taking the horns sheaths off the core, and after thoroughly cleaning the horn with soap and water and an old nail brush, dry it, and after giving it a slight coating of oil, rub it off again at once; this gives it a nice polish. Now make it over to a 'soonar,' or silversmith, to mount with silver; this should be done by lining the inside of the horn with silver, and fixing a silver perforated top on like those used on ordinary 'muffineers'

"There, 'bus,' Mr. Editor, I think I have said enough. It is needless to give any more incidents of my personal experiences in Gooral shooting; if I were to do so it would only fill pages, and weary your readers, and my object was not to weary but to convey information, and perhaps instruction and advice. I have endeavoured to show that those who are enjoying leave up in the hills, and who care to have a few days' Gooral-shooting near our various hill stations (and there are many mighty 'sons of Mars' who always have the time and opportunity) may do so with advantage. For there is the pretty head to your wall as a perpetual trophy, or the horns for a pair of 'muffineers,' if you have any to spare; a pretty present to send home; besides the recollection of a pleasant day or two, which may some day find its way into the *Asian*, let us hope; and lastly, for the most important of all, not having allowed yourself to get rusty."

Family CAPRIDÆ,—TRUE GOATS.

Horns in both sexes situated behind the orbits, erect, compressed, curved backwards with a longitudinal keel in front and transversely ribbed; chin of males bearded; muffle small or absent; mammæ 2—4.

Gen. CAPRA, *Linn.*

Horns in both sexes long, angular and recurved. No muffle nor eye or inguinal pits. Feet pits in the forefeet only, or in none. Females with two mammæ.

CSL

Capra ægagrus, *Pall., Zool. Russo. As. Dc. F. Viag in Pers*; *Hutton, Calc. Journ. Nat. Hist. Pl.* xix., p. 521; *Blanford's Eastern Persia* p. 89; *Murray, Hdbk. Zool., &c., Sind.* Hircus gazella, *Gray, Cat. Rum. Mam.* Capra caucasica, *H. Smith.* Capra gazella, *Linn.*

The *Pusang* (male) and *Boz* (female) of the Persian and Afghans; *Surrah* of the Sind Hill Tribes and Beloochis.

THE WILD-GOAT OF ASIA MINOR, OR THE SIND IBEX.

Colour variable seasonally; generally light or fulvous brown, lighter in summer; a conspicuous dark dorsal streak present. Horns recurved, triangular, 40—58 inches along the curve. Upper scimitar-like edge much worn, rugose or broken into irregular knots.

Length.—6 to 6½ feet, including the tail, which is small. Captain Hutton (*Calc. Journ. Nat. Hist*), in describing this species, says:—"The colour of the animal varies with age and season, but it may be said generally to be of a brownish grey, more or less intense. During the winter it is paler, and in old specimens altogether pale grey. The face in the mature male is of a deep sooty brown, approaching to black interspersed with grey at the base of the horns and on the cheeks; the forepart of the throat and chest are also of the same colour, which rises obliquely from the latter round the shoulder and unites at the wither, so as to form a dark and distinctly formed collar, while the same colour again extends itself in a stripe along the back from the base of the horns to the extremity of the tail, which is wholly dark brown or blackish. Tail short, naked beneath, and carried, when the animal is alarmed and on the alert, turned up and firmly pressed against the back as in the domestic goat. In general, at other times it is pendant. Beard moderately long, deep brown or black, sometimes interspersed with a few white hairs, which spring from the chin. Shoulders deep brownish grey, which colour continues down to the knees, from thence to the fetlocks, and forms two bands round the leg, the one at the knee and hock, the other at the pastern joints. Belly and underparts whitish, with a deep brown median line on the sides, which passes along the anterior edge of the hind legs.

"In summer the colour of the fur changes much, the whole of the upper parts being of a yellowish or fawn-coloured brown, the mane on the neck and withers nearly or altogether wanting, and the face has a brown front or streak down its centre with a stripe of the same colour from the inner canthus of each eye to the nostril. The throat and chest are less dark, and the collar round the shoulders often wanting. In immature specimens the colours are much the same as the summer dress, but the dark lines are always less intense and often wanting."

Hab.—Sind, the Pubb range of hills; also the mountainous region of Beloochistan, Afghanistan, Sooliman and Hazara ranges, Persia and Asia Minor.

It inhabits a great range of climate from 1,000 feet above the sea, close to the coast of Beloochistan, and Mr Blanford adds to the peaks of the Elburz, ten degrees farther north, at a great elevation. Young are dropped in May; generally 2 – 3 in number.

Captain Hutton, who has paid much attention to the habits of this species, says: "The attitude of the animal when on the alert and when springing fearlessly from crag to crag is bold and haughty, giving an idea of great muscular strength and agility, which the animal possesses in no ordinary degree. Its speed however is not sufficient when it descends to the plains to preserve it from the greyhound; but this is an extreme step with it, as unless driven from its haunts by the intensity of the winter it never condescends to visit the lowlands. Its usual quick pace is a kind of canter, which, among the hills, enables it to rapidly evade pursuit, but it is not nimble enough, nor is the stride sufficiently long to suit it to the plain lands, though for scaling mountainous heights it is admirably adapted. The leaps this ibex takes are tremendous, and almost pass credulity, and the faculty or the power of stopping *dead short* must be of great service to it in leaping down crags to avoid falling into the yawning chasm and precipices of the mountains."

The adult female has the colours of the upper parts grey, with a shade of pale brown over all, and a broad dark brown stripe down the centre of the face, with another from the inner canthus of the eye to the nostrils; dorsal stripe present, sometimes absent; no beard.

The horns of the male differ in length according to the age of the individual. They are (in adults) very large, semi-elliptical, curved strongly backwards and gradually outward towards the apex, approximated at the base, divergent at the summits and transversely wrinkled. The annual markings of increase of length are very strong and remarkable, standing forward on the anterior edge or angle, in prominent, somewhat irregular knobs. This peculiarity, Capt. Hutton adds, is caused by the acute edge of the horn being chipped and worn away by friction and combat, but the general opinion of natives in Sind is that these rugose prominences are caused by the animal letting itself down on its horns in descending crags, when pressed, or when it has missed its footing. At the base the horns are destitute of these prominences. The following are measurements of horns of females given by Capt. Hutton :—

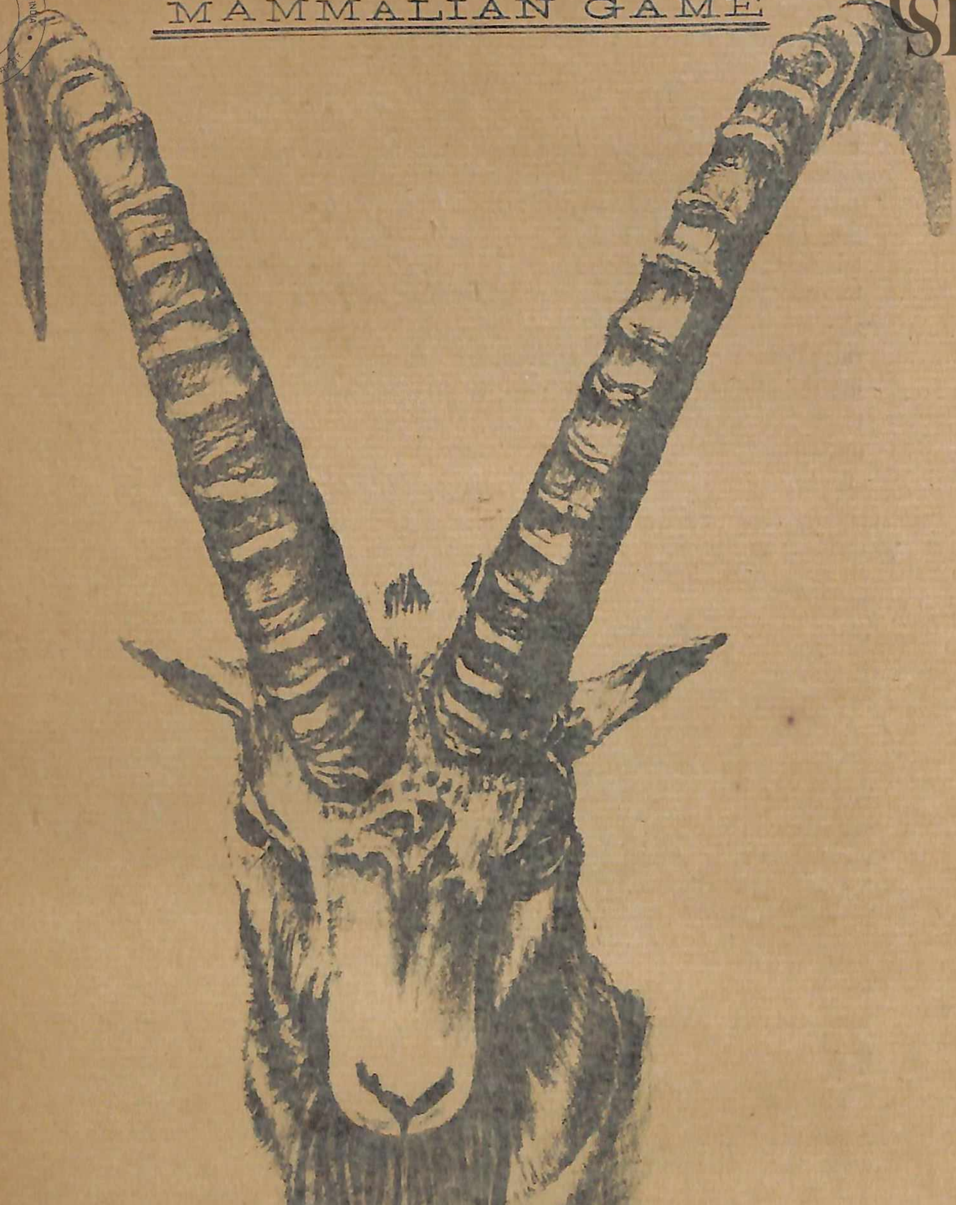
1. Length along curve from base to apex, 13 inches; distance apart at apex, 5¾ inches; apart at base, ¼ inch; circumference at base, 4 inches

2. Horns much wrinkled with transverse rugosities, length along curve, 12 inches; between the apices, 4 inches; apart at base, 1 inch; circumference, 3½ inches.

It is a very shy and wary animal, and, like the Himalayan species, hard to circumvent under any circumstances. What "Spindrift" says in an article on Ibex shooting in the Himalayas (*Asian*, July 20th, 1880) is equally appli-

CSL

MAMMALIAN GAME



THE HIMALAYAN IBEX

Capra Sibirica.

CSL

cable to this species. He very correctly says, that "whatever chances of success a man by himself may have in pursuit of the animal, that chance is just halved if he be accompanied by a friend, — for there are then two men instead of one, who may slip, sneeze, stumble, show themselves, or do the hundred and one things that may spoil a stalk." He adds : "If however quite by yourself, wary as the animal is, you can generally get near enough for a shot by exercising a little patience and paying attention to a few well-known rules, which indeed are applicable to every kind of hill shooting." For instance, he says, " you must make an early start and climb at once to the top of the ridge, on the slopes of which you hope to find your game. It is all-important to get above the animals whose chief vigilance is directed down hill."

" During the day they remain high up, lying down and sleeping in some commanding position, where to approach them may be impossible. But in the evening they come down to the grassy slopes to feed, and remaining there all night, wend their way up again in the early morning. This is the time to look out for them. If you have got on your ground early you may be fortunate enough to waylay a herd as they leisurely browse their upward way to their retreat for the day. If not you must mark them down, and when they are comfortably settled, try and stalk them. This, of course," he says, " is the real jam. It may take you hours of hard work and breakneck climbing to get near them, but you are repaid at last."

The flesh of the ibex is excellent venison. The skins are converted into water and flour bags by the hill tribes, and the horns are carried by certain sects of mendicants as an insignia of their calling and as trumpeting horns.

The true Bezoar (*Pazahr*), a calcareous concretion, is said to be obtained from the stomach of this species. It is to the present day highly prized as a sovereign antidote in snake and other poisoning cases, and is considered an universal remedy for all diseases. The price obtained for fairly large specimens range from Rs. 150 to Rs. 175. Small specimens from ½ to 1 inch in diameter are had at from Rs. 50 to Rs. 75.

Capra sibirica (*Meyer*), *Jerdon, Mammals Ind.* p. 292, No. 235; *Spindrift, Asian, March,* 1881, p. 101; *id., March* 1, 1881, p. 152; *Sterndale, Pop. Nat. Hist. Mam. Ind., Asian, Jan.* 3, 1882, p. 95; *id., Pop. Nat. Hist. Ind. Mam.* p. 444.

Vern.—Sakin, or *Iskin* of the Himalayas; *Bus* or *Boz* in the Sutlej; *Kale,* Kashmiri; *Tangrol* in Kulu; *Skeen,* Ladak.

THE HIMALAYAN IBEX.

General colour light brownish; a dark stripe along the median dorsal line in summer, dirty yellowish white in winter; under fur mouse colour, soft and thick; beard black, 6—8 inches long; horns long, scimitar-shaped, curving

GSL

blackwards over the neck, flattened on the sides, strongly transversely ridged in front, and from 40 to 50 inches long, measured along the curve. Females with thin horns about a foot in length.

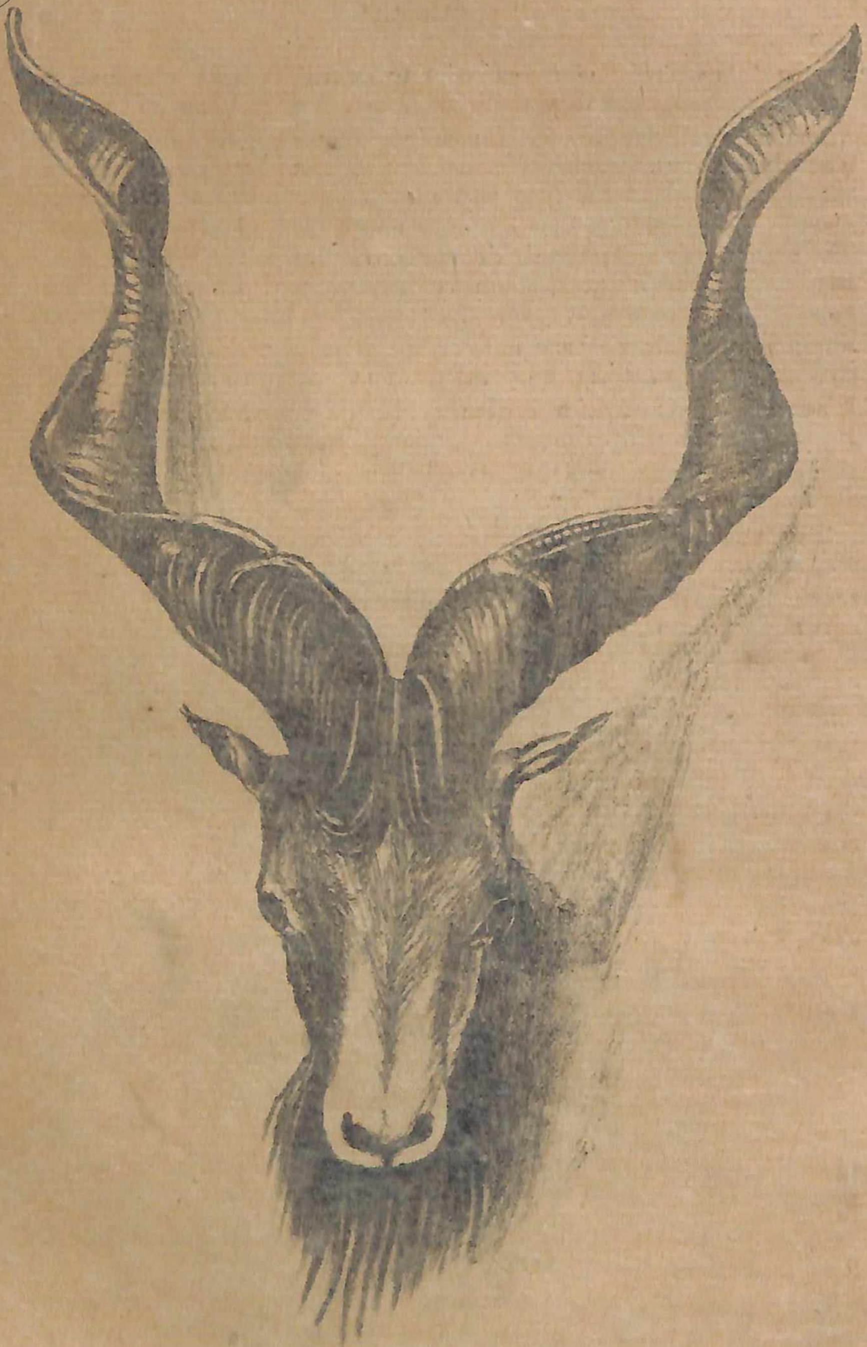
Length.—3 ft. 6 to 4 ft. 6 inches; height at shoulder about 3 feet; tail 8 inches.

Hab.—Throughout the Himalayas, from Kashmir to Nepaul. Kinloch gives the following localities: Kunawar, Kulu, Lahoul, Spiti, Kashmir, Baltistan, various part of Tibet, and also Ladakh.

The shooting of this game animal, or rather its pursuit, is exactly what has to be encountered in the pursuit of *C. ægagrus*, the preceding species; the same hazardous climbs, the same watchfulness, and the same rules should be followed. It inhabits similar precipitous ground in the highest parts of the mountain ranges during the day, only coming down to the grassy slopes to feed in the morning and evening. The best months for following this sport is said to be April and May. Then the Ibex descends to crop the green grass which springs up as soon as the snow is melted. It is heartbreaking work, walking up and down the mountain sides in July and August, so it is said in the "Sportsman's Guide to Kashmir and Ladak." The whole country is open for the animals to roam over; and nothing but the most wonderful luck will give a good bag at that season. There is certainly, as "Spindrift" (*Asian*, 20th July, 1880,) says, "no sport to compare with Ibex shooting in the Himalayas." "What," he exclaims, "can be more delightful than the feelings evoked by being in the midst of scenery so glorious and in a climate so pure and bracing! What excitement can equal that experienced in the last few moments of a long and patient stalk! Or, what can provoke a keener thrill of enjoyment than a successful shot, when, as the smoke clears away, and while the report of your rifle is yet reverberating among the snow-clad rocks and peaks around you, you see the shaggy patriarch of the flock with his flowing beard and noble horns breathing his last on the grassy slope below you. There is, however," he says, "one drawback,—a great one I think to any shooting in the hills. It is that to be successful you must be alone. Half the charm of a successful shikar trip is the *chat* in the evening with genial companions after a hard day's work, when all the incidents of the day are discussed and criticised; when the horns and skins are produced, measured and examined again and again, and plans laid for future expeditions."

It is but too true that if you really mean to make a good bag in the hills you must forego all this; or you and your companion must be very old and tried friends; with no spark of jealousy of each other. And even so you cannot shoot together. You must separate, and each take up adjacent villages and agree after hunting to join camps at some convenient village after a certain number of days, otherwise, if two attempt to shoot together, the result will be disappointment and vexation. "Spindrift" gives an account of

MAMMALIAN GAME



SPIRAL-HORNED MARKHOOR

Capra Megaceros

GSL

this latter, where two fellows went out with a village shikaree, who brought them up to a fine herd of male ibex; both being anxious to secure a trophy, banged off independently, and without even waiting to pick the finest head. The one with the Regulation Snider hit; his friend with double express missed. Away went the herd, and the wounded ibex also. Both gave chase; the man with the Snider gave it up as a bad job and went home. The other, however, persevered, and after a long time brought the animal to bag. It then proved that the animal had only *one* horn!; when the head was brought in *both* claimed it! "My dear fellow," said A, "I hit it first; you will admt that, I suppose: and therefore it's mine." "But, d—n it," says B., "you gave it up and went home, and if I hadn't followed it up and killed it, it would have been on its native hills at this present moment, and therefore I consider it's mine." Altogether they had a pretty squabble over it, and the incident serves to show what may not improbably happen when two men try to shoot in company.

The trophy of this noble animal being the horns, the following from "Sportsman's Guide to Kashmir and Ladakh," would not be uninteresting as showing the lengths of some inspected by the writers:—

Length in inches.	Girth.	Locality.
50	10	Not known.
49	11	Krishuge, Wardwan.
48	12	Lidarwat, Kashmir.
48	10	Boonjie
46	13½	Krishuge.
45	13	"
45	12	"

Capra megaceros (*Hutton*), *Jerd., Mam, Ind.* p. 291, No. 234; *Kinloch's Large Game of Tibet*, p. 70; *Cassell's Nat. Hist. Ruminantia* (*Garrod*); *Sportsman's Guide to Kashmir and Ladakh, Asian*, 1881, *May 10th*, p. 30; *Sterndale, Pop. Hist. Mam. Br. Ind, Asian, Jan* 3, 1882; *id., Pop. Nat. Hist. Mam.* p. 441.

Vern.—Markhor, Afghanistan and Beloochistan; *Rahchee* or *Ra-po-chee*, Ladak.

THE MARKHOR.

Of a dirty slaty grey colour; beard darker; in summer the fur has a reddish tint; neck and breast with long dark brown hair which reaches to the knees; forelegs brown. Females of a reddish tinge, and with a small beard and small slightly twisted horns. Horns of male 49 to 50 inches.

Hab.—Afghanistan, Tibetan Himalayas, Kashmir, Hazara Hills, Wardwan Hills, on the Suliman Range and Ladakh.

This is a magnificent looking animal, especially when seen in its native habitat. He has a noble form, and I may say looks quite majestic standing on an eminence or crag. Its flowing beard reaches to nearly its knees,

CSL

while his grand spiral horns, 40 to 50 inches in length, and his entire deportment give him a very "venerable and dignified aspect." According to Kinloch it inhabits the most precipitous and difficult ground; where nearly perpendicular faces of rock alternate with steep grassy slopes and patches of forest. It remains concealed during the day time in the densest thickets, and like the ibex feeds only in the mornings and evenings. No animal's pursuit, he says, leads the sportsman over such dangerous ground as that of the Markhor. Great care is necessary to stalk them. In the "Sportsman's Guide to Kashmir," it is said that the Pir Pinjal range furnishes good sport. and some extremely handsome heads, and horns with occasionally 3 spirals. In the Kaj-naj Range, too, good heads it is said are still obtainable. Two measurements are given of horns got here in the one stalk :—

Length along curve.	Girth.	Divergence at tip.	No. of spirals.
53 inches	9½	26	2⅓
43 "	11	31	2½

The spirals were sharp, but the horn lacked the roundness of that variety. The writers of the "Sportsman's Guide" say: "We have no Sheik Bodeen large horns to measure, nor do we remember having seen any of great length. From Afghanistan we possess horns of 35 inches, which were said to be fair specimens, and which are as large as any we have come across. They are massive up to the top, and round, and afford a striking contrast to the next variety, the Astor or Murga Parbat Markhor. This animal is larger than its representative in Cashmere Proper. Many stand as much as eleven hands; whereas the largest we have seen in other localities barely reached ten and a half hands. The curves of the horns are bold and flat; the divergency at the tips great; and the massiveness which is shown to such advantage by the single twist, leads this variety to be considered by most people the handsomest of the four. Some very fine specimens have been brought down from the Astor shooting grounds; amongst them single horns of 63 and 61 inches; and we have lately measured a head with horns—

Length along curve.	Girth.	Divergency at tips.
52 inch.	12½ inch.	43 inch.

They say "we have seen several pairs which had been picked up in the snow about this size, but unluckily they were all much damaged."

The following is taken from the "Sportsman's Guide":—"For localities in the different tracts of country where sport is likely to be obtained, we begin with the Pir Panjal, and mention Sullar and Jarzinee, and the Tosha Maidan near the Norpel Pass, the Chota Gullee and Chitapani: these two rivulets join from the Posheana river. Beyond the Pir Pass towards the Koonjenay Range Markhor do not seem to wander. The suitable season is as soon as the snow is sufficiently melted to allow of the game being followed. In most years this is not before the 10th of May.

CSL

"In the Kaj-nag hills, in ordinary years, the Kutai nullah opposite to the Uri camping ground is a first-rate place, if visited early in March. A little later *try* the Luchipoora nullahs, *viz.*, the Malagan, the Bawni, the Goojur and Push. The last is recommended in the rutting season (which is late in November) provided the snow has fallen, if not the grass is so dry, and the leaves crackle so noisily under the most careful tread, that stalking is only waste of time.

"In April the Lunbur nullahs, particularly the two branches of the Khar Kohl, of which the local names are the Gom-lettirs and the Metahwyan, are the resort of large markhor. With the exception of the Kutai, these ravines are all small and do not stand much firing. In the Shamshibri mountains, which lie to the north of the Kaj-nag, markhor frequent the ground as far as Teetwal on the Kishen Gunga.

"Markhor are gregarious, and are sometimes met with in large herds. The small males and the females may be seen together at all seasons, but the older bucks hold aloof from the main gatherings. In their winter coat of grey they are difficult to discern, for they often stand motionless amongst the rocks, which are the same color; again, when the pushm or under fleece has been shed, and the animal presents a reddish or brownish blue, they are still more difficult to see when in the brown, dried-up grass.

"The black beard and masses of hair on the neck and breast add greatly to the beauty of the trophy; and the shikaree should be warned not to cut the throat in the orthodox fashion, from ear to ear, but to leave the full length of the neck.

"The female is an insignificant looking animal, with horns of about ten or eleven inches in length."

As to the question whether markhor or ibex are much frightened by hearing falling stones, it is said they scarcely could be, as they are often to be found in ravines, where stones are falling all day long. In experimenting on this subject, the writers of the "Sportsman Guide" says: "For a long time we lay concealed, but before going away a stone was rolled down; the markhor simply looked up, and then went on feeding. A second was sent down the hill; this made them suspicious, they bounded on one side, and gazed intently. A third stone was tried; this was too much for their patience, they left the spot, but not hurriedly. From this we would suggest that when on the stalk any accidental noise is made the only thing to do is to keep quiet for some minutes. The ring of the iron spike of an Alpen stock on a stone is often the means of spoiling a stalk, and, as every sportsman knows, the stick should be reversed when game is sighted."

No one should start on a trip after this game unless he is prepared to exercise the greatest patience, and to show the most dogged perseverance.

CSL

Big bags of fine ibex are made; but we never heard of a big bag of fine markhor, and we should think ourselves well repaid by obtaining one fair shot for each fortnight we were on the shooting ground."

Gen. HEMITRAGUS.

General characters those of *Capra*; muffle small; mammæ 2—4; horns trigonal, compressed on the sides and knotted on the upper edge.

Hemitragus jemlaicus (*H. Smith*), *Jerd.*, *Mam. Ind.* p. 286; *Sterndale, Pop. Nat. Hist. Mam., Asian, Jan.* 17, 1882, p. 109; *Shooting in the Himalayas*, p. 24; *Ind. Sporting Rev.* iii. 1857, p. 202.

Vern.—Tehr or Jehr, Simla; *Jeharal*, Nepaul.

THE TEHR.

Brown above, varying from light or grey brown to yellowish brown in some specimens; neck and shoulders and foreparts with long shaggy hair, growing gradually shorter on the hind quarters; hair on the foreparts of a light ash, with a bluish tinge, the hair very long and forming a magnificent mane, which reaches sometimes to the knees. A dark mesial dorsal line. Tail short; legs moderately long and stout. Horns in both sexes short, triangular, sharp edged in front, curving back in the form of a demicrescent. Basally they are generally from 10 to 11 inches in circumference; in length, very few are known above 15 inches.

The female is comparatively very inferior in size to that of the male, the hair is shorter, and there is no shaggy mane. The horns too are very small. She is of a reddish brown colour, and has the same dark dorsal streak. May and June are the months in which the young are born.

Length.—Male: Head and body 4½ feet; height 3 feet to 3·6.

Hab.—The Himalayas generally, at very high elevations between the forest and snow limit.

There is not much known of this animal, and though its flesh is not edible, except when young, nor the horns much of a trophy, yet it is sought after for the sake of sport. Kinloch in his "Large Game of Thibet" speaks of the Tahir as a fine-looking beast, about the same size as the Ibex, but more heavily made. He adds that, like the markhor, it is a forest-loving animal, and though it sometimes resorts to the rocky summits of the hills, it generally prefers the steep slopes which are more or less covered with trees. Owing to the ground it inhabits being so covered with jungle, its pursuit is attended with a great deal of labour and uncertainty. It is said to be very tenacious of life, and even when mortally wounded, it will frequently make its escape into utterly impracticable ground. In autumn the animal becomes very fat and heavy, and its flesh is then said to be in high favor with the natives. It is of course not eaten by Europeans. Kinloch says an Englishman would rather not be within one yard to leeward of him, the perfume being equal to treble-distilled "*bouquet de bouc.*"

Hemitragus hylocrius (*Ogilby*), *Jerd.*, *Mam. Ind.* p. 288; *Sterndale, Pop. Hist. Mam. Asian*, 17*th Jan.* 1882, p. 110; *id.*, *Pop. Hist. Mam.* p. 451; *South Ind. Observ.*, 3*rd and* 17*th Sept.* 1868.

Vern.—*Warra-adoo* or *Warriatta*, Tamil.

THE NEILGHERRY WILD GOAT, OR THE IBEX OF MADRAS SPORTSMEN.

Dark sepia brown above, with a pale reddish brown saddle more or less marked and paler brown on the sides and beneath; neck and withers of male with a mane; legs somewhat grizzled with white, they are dark brown in front and paler posteriorly, a callous spot on knee surrounded with hair. Head dark brown, grizzled with yellowish brown; eye surrounded by a pale fawn-coloured spot. Horns short, curving backwards, strongly keeled, internally rounded, externally with numerous close rings. (*Jerd.*) Height at shoulder 41—42 inches; tail about $3-3\frac{1}{2}$. Length, including tail, 6 feet 4—5 inches; horns 9 to $9\frac{3}{4}$ inches in circumference at base; 12 to 19 inches in length. Sterndale says he measured a pair which was 17 inches in length.

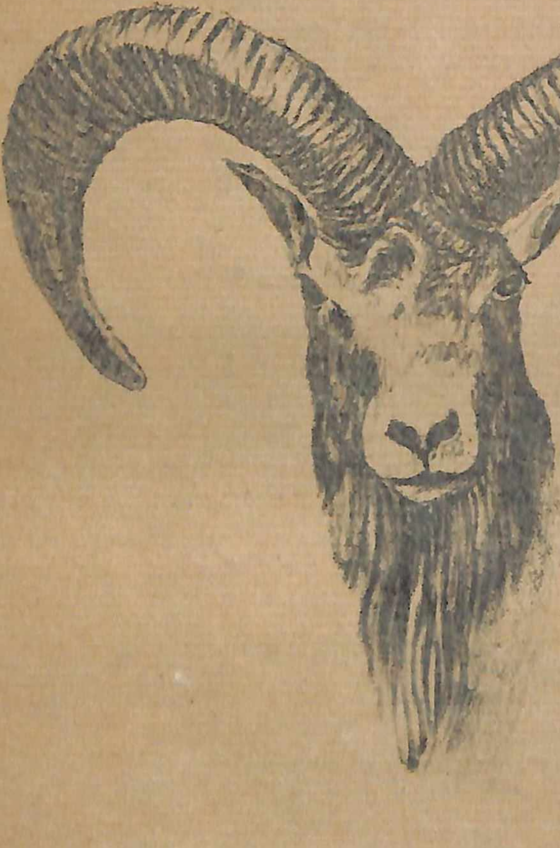
Hab.—The Western ghauts, southerly towards Cape Comorin. According to Jerdon it frequents the Northern and Western slopes of the Neilgherries, where the hills run down in a succession of steep stony slopes, or rocky ridges, to the high table land of Mysore and the Wynaad. It is found in herds of from 20 to 30. Colonel Hamilton says he has seen herds of 60 and more, and 35 also.

The same precautions are necessary in the shooting of this animal, as that of the Himalayan species. It inhabits very similar situations, and the steep slopes where they are generally found are often impracticable and dangerous. "Hawk Eye's" description in the South *South of India Observer* is here quoted as being of interest to both sportsmen and naturalists. It is taken from the *Asian* of 17th January, 1882.

He says: "It is a pleasant sight to watch a herd of ibex (wild goats) when undisturbed, the kids frisking here and there on pinnacles or ledges of rocks and beetling cliffs, where there is seemingly scarcely safe foothold for anything much larger than the grasshopper or a fly; the old mother is looking calmly on, or grazing steadily while the day is young, cropping the soft moss or tender herbs and sweet short grass which spring from the crevices of the craggy precipices in rich abundance. Then, again, to see the caution observed in taking up their resting or abiding places for the day, where they may be warmed by the sun, listening to the roar of many waters, and figuratively, we may say, chewing the cud of contentment, and giving themselves up to the enjoyment of their nomadic life and its romantic haunts. Usually before reposing, one of the herd, generally an old doe, may be observed intently gazing below, apparently scanning every spot in the range of her vision, sometimes for half an hour or more before she is satisfied that all is well; strange to say, seldom or ever looking up to the rock above. Then being satisfied on the one side, she observes the same process on the other, eventually calmly lying down, contented with the precautions she has taken, that all is safe. Her post as sentinel is generally a prominent one, on the edge and corner perhaps of some ledge, to be well sheltered from the wind and warmed by the sun, along which the rest of the herd dispose themselves as inclined, fully trusting in the watchful guardian whose manœuvres I have been describing. Should the sentinel be joined by another, or her kid come and lie down by her, they invariably place themselves back to back, or in such a manner that they can keep a look out on either side. A solitary male goes through all this by himself, and wonderfully careful he is, but when with the herd he reposes in security, leaving it to the females to take precautions for their mutual safety. I have stated that these animals seldom look above them, except when any cause of alarm leads them to do so. I recollect an instance which I will relate, partly to show the advantage of a good color for a stalker's dress, and to illustrate what I have mentioned above. I had disturbed a buck ibex accidentally one morning, and after watching him a long distance with the glass observed him to take up a position and commence the vigilant process previously mentioned. By this I knew he was prepared to lie down. He was a long time about it, but eventually he was satisfied, and took up his post on a prominent rock, from which, as lying with his back to the mountain, he held a clear view in front and on both sides. I approached from above, the wind all right, and the ibex reposing comfortably in fancied security. I had to pass a large rock to clear an intervening impediment, and gain a full view of the buck, as I could at first only see his horns. I had taken the precaution to remove my shoes, the grass being very dry and noisy. The crunching of the dry grass as I moved attracted the notice of the ibex, and suddenly he looked back and up towards me. He was not more than eighty or ninety yards below,—I leaned against the rock, my shikar dress blending with the dark grey of the stone and burnt-up grass so completely as to deceive even my lynx-eyed prey. Long, long he looked, till my very knees trembled with anxiety. At last he turned his head, but I knew better than to move, being sure he would have another look. He did so, and it proved to be his last, for when he again turned his head away, I quietly subsided, and in another moment the buck died on its rocky bed."

The female has only two mammæ and usually produces two young at a time.

MAMMALIAN GAME



THE OORIAL
Ovis Cycloceros.

CSL

Family, OVIDÆ,—SHEEP.

Horns behind the orbit more or less spiral, wider than deep, angular, much wrinkled, turned downwards, often almost into a circle. No muffle; no beard. Throat with long shaggy hair; feet pits small. Mammæ 2.

Gen. OVIS.

Characters same as those of the family.

Of the wild sheep, we have in British India proper only two species, *Ovis cycloceros*, and *Ovis nahura* or the Bhurrel. *Ovis ammon*, *Ovis Polii*, *Ovis Karelini*, *Ovis Brooksi*, *Ovis Vignei* and *Ovis Blanfordi* are species which are outside our limits. I will however treat of them here as such, and give only such information in regard to them, as could be got from sportsmen and authors.

Ovis cycloceros, *Hutton, Calc. Jour. Nat. Hist. vol* ii. 1842, p. 514; *Jerd., Mam. Ind.* p. 295; *Gray, Cat. Ruminants*, p. 55; *Murray, Hdbk. Zool., Sind*, p. 14; *id., Vertebrate Zool. Sind*, p. 59; *Sterndale, Pop. Nat. Hist. Mam. 6th Dec.* 1881, p. 68 (*Asian*).

THE PUNJAB WILD SHEEP.

Horns sub-triangular, much compressed laterally and posteriorly, transversely sulcated, curving outwards and returning inwardly towards the face. General colour rufous brown, or uniform yellowish or fawn-coloured brown. Face livid or bluish grey. Sides of mouth and chin white. Belly and legs below the knee whitish. A profuse beard from the throat to the breast, intermixed with some white hairs, reaching to the level of the knees; legs below the knees and the feet white; the belly also white; outside of legs and a lateral line blackish. Tail short, white. Eye pits large. Horns $2\frac{1}{2}$ to $2\frac{3}{4}$ feet round the curve. Diameter at base 4 to $4\frac{1}{2}$ inches.

Length—Male: 5 feet; height 3 feet. Female, with short straight horns, slightly bent behind. No beard. Pupil transverse, black; irides yellowish grey.

Hab.—The warmer mountainous regions of Sind, Punjab, Beloochistan, Persia and Afghanistan, at less elevations than the ibex, and during winter frequently on the plains and valleys. In the Himalayas it is said to be rare, being confined to the belt of country between Cashmere and the Indus Valley; but in the Sooliman, Hazara and Salt Range of the Punjab, numerous, in fairly large flocks.

In general it is extremely shy and wary, and said to be difficult to approach, taking alarm at the least noise, even of the making of one of their own party while browsing. Like most wild ruminants, this sheep also has a sentinel posted when the herd is feeding. In some districts, however, where they have

CSL

not been hunted, they are said to feed with domestic cattle, &c. When taken young they are easily domesticated; but the rams are treacherous, making sudden and fierce attacks upon unarmed persons. Kinloch, in his "Large Game Shooting in Thibet and the North-West," gives the following account of its habits :—

"The Oorial is found among low stony hills and ravines, which are generally more or less covered with thin jungle, consisting principally of thorny bushes. During the heat of the day Oorial conceal themselves a good deal, retiring to the most secluded places, but often coming down to feed in the evening on the crops surrounding the villages.

"When fired at, Oorial usually go leisurely away, stopping to gaze every now and then, so that several shots may often be fired at one herd.

"When suddenly alarmed, the males give a loud shrill whistle, like the ibex. This is an invariable signal for the departure of the herd, which keeps moving all the rest of the day until dusk.

"The female gestates seven months. The rutting season is in September."

According to Captain Hutton the flesh is good and well-flavoured, while the horns are placed as trophies of success and proofs of skill upon tombs and temples.

Ovis nahura (*Hodgs.*), *Jerd., Mam. Ind. No.* 237, p. 296; *Blanf., Sc. Res. Yark. Exped.* p. 317; *Shooting in the Himalayas*, p. 60; *Forest and the Field, p.* 123; *Rifle in Cashmere*, p. 43; *As. Soc. Journ., Beng., April*, 1847; *Aberigh-Mackay Sport in Ind.*; *Guide to Cashmere and Ladak, Asian*, 1881; *Sternd., Mam. Ind., Asian*, p. 68, 1881.

Vern.—Burhel, Buroot, in the Himalayas; *Napu, Na*, or *Sua*, Tibet and Ladak; *Nervati* in Nepal.

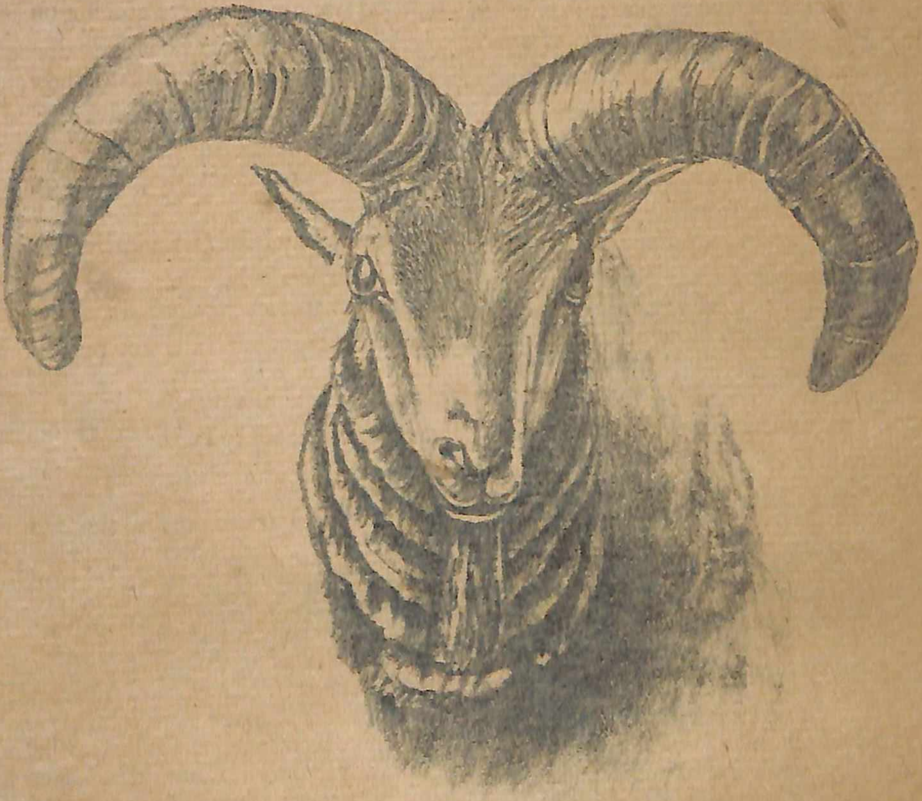
THE BLUE WILD SHEEP.

General colour a dull slaty blue, slightly tinged with fawn; the belly, edge of buttocks, and tail, white; the throat, chest, front of forearm and cannon bone a line along the flank dividing the darker tint from the belly, the edge of the hind limbs and the tip of the tail deep black; horns moderately smooth, with few wrinkles, rounded, nearly touching at the base, directed upwards and outwards, the points being turned forwards and inwards. The female is smaller, the black marks smaller and of less extent; small, straight, slightly recurved horns; nose straighter. The young are darker and browner. (*Sterndale.*)

Length head and body, 4½ to 5 feet; height 30 to 36 inches; horns 2 to 2½ feet round the curve; circumference at base 12—13 inches; tail 7 inches;

CSL

MAMMALIAN GAME



THE BURRELL, OR BLUE WILD SHEEP
Ovis Nahura.

CSL

Hab.—From Sikkim, and, as Jerdon says, probably Bhutan, right away through Tibet, extending up to the Kuenluen Mountains north of Ladak, and Ladak itself.

The habits of the Burhel are not unlike those of the Punjab Wild Sheep. It inhabits situations quite as similar and as difficult of access in the snowy ranges. Aberigh-Mackay, in his "Sport in India," quotes General Markham to the effect that the Burhel is the only variety of the wild sheep found in Tibet, and is of all animals of the ruminating class the most worthy of notice. It is not rare he says, but from the toil and fatigue attendant upon its pursuit, it is generally considered as the first of Himalayan game animals, and the killing of it the *ne plus ultra* of Himalayan shooting. The full-grown male, he adds, is nearly twice the size of a common English ram; the females are about one-half its size. The Burhel is exclusively confined to the snowy ranges, or the large spurs jutting from them; its favorite resorts being between the verge of forests and the extreme limits of vegetation. During the summer months, they keep near the top of the hills they inhabit, or in the ravines near the sources of large streams which rise from the snow, only occasionally descending in any numbers to the lower parts. In autumn, as the herbage becomes scanty and dried up, they gradually descend and keep more to the middle and lower parts of the hills. In general the Burhel is considered a shy and wary animal, difficult in the extreme to approach, and taking alarm at the least appearance of men, even when at an immense distance. They keep together in flocks of from four or five to forty and fifty, and sometimes, it is said, over a hundred. The mountains separating India from Tibet between the Sutlej and Nepaul are their home. Favorite resorts are mentioned as being the valley of Leptel beyond the Millam Pass; the valley of Spiti and the Paspa valley near the source of the Ganges. General Markham's opinion is that the flesh of the Burhel surpasses the best mutton, and has the advantage of being generally tender soon after the animal is killed.

Other species of Wild Sheep *not Indian* are:—

1. *Ovis Polii* or *Marco Polo's sheep*, which inhabit the Thian Shan mountains north of Kashgar and Yarkand, at elevations of 9,000 feet.

2. *Ovis Ammon*, the Argali, which inhabits the Tibetan Himalayas at 15,000 feet and upwards.

3. *Ovis Karelini*, inhabiting the mountains north-west of Kashgar, and thence northward beyond the Thian Shan mountains on to the Semiretchinskoz Altai.

This is described in *P. Z. S.* 1875, p. 512; also in *P. Z. S.* 1874, p. 425, as *Ovis polii.*

4. *Ovis Brooksi*, inhabiting Ladak. This, according to Sterndale, is found on only a single head, and it is not certain where the animal was shot. See woodcut of skull and horns in *P. Z. S.* 1874, p. 143.

5. *Ovis Vignei*, which till lately has been confounded with *O. cycloceros*, inhabits Little Tibet and Ladak, from 12 to 14,000 feet.

As each of these five species inhabit different regions, the sportsman need only expect to get the different forms in these different regions. Of *Ovis Blanfordi*, from the central hills of Khelat, there is, I believe, some doubt as to its being a good species. It is closely affined to several of the above.

Family, CERVIDÆ.

Nose tapering; muffle moist, and naked; crumen distinct. Antlers well developed; suborbital pits distinct. Canines small or rudimentary. Young generally spotted.

Gen. CERVULUS.

No digital phalanges; horns situated on high pedicels of bones covered with hair, face longitudinally ridged, horns small, with a single beam and a basal snag; canine tusks in upper jaw.

Cervulus aureus (*Ham. Smith*), *Jerd., Mam. Ind.* p. 264; *Sterndale, Pop. Nat. Hist. Mam.* p. 500.

Vern.—Kakur, Bherki, Hind.; *Maya*, Beng.; *Kuagori*, Telugu.

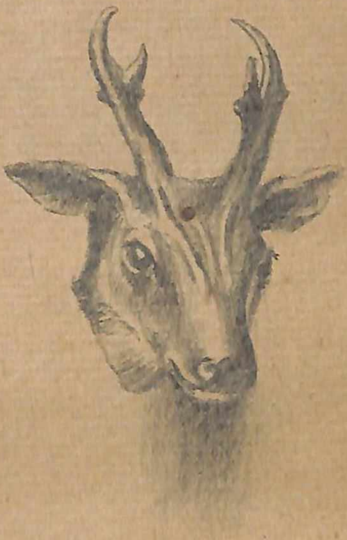
THE BARKING DEER

Head and upper parts of the body rufous bay, the longitudinal creased ridges of the face dark brown, with a darker line running up to the base of the horns; chin, throat, inside of hind limbs and tail underneath white; forelegs a bluish slate color.

Length.—Head and body $3\frac{1}{2}$ feet; tail about 6—7 inches; horns from 5 to 8 inches.

Hab.—India, Burmah and Ceylon; also the Malay Peninsula, Sumatra, Java and Borneo. (*Sternd.*) In South India it is found on the lower slopes of the Shevaroys, and Mr. A. W. Morris adds, is much persecuted by the Malliakies or hill-men, who consider it a very toothsome morsel. It is a shy and wary animal, and is said to have a wonderful way of threading tangled underwood and escaping pursuit. Mr. Morris says, that though hard pressed, he had seen these animals skulking along quite quietly, dodging into one bush and out by the other, eventually foiling the sportsman. They also have a habit of lying still in cover till almost trampled upon, when they jump up in a moment and make off, escaping by the very suddenness of their appearance. When the pears are in season, the animals may be seen often in the broad daylight, on the roads through coffee estates, feeding on the fallen fruit.

MAMMALIAN GAME



THE BARKING DEER
Cervulus Aureus.

6P-1
CSL

MAMMALIAN GAME

Stag with Horns matured

Gen. RUSA.

Antlers with a brow tine; beam bifurcate; muffle large; lachrymal fossæ large and deep; canines rudimentary in both sexes; no feet pits. Neck maned.

Rusa aristotelis (*Cuv.*), *Jerd., Mam. Ind.* p. 254; *Sterndale, Pop. Nat. Hist. Mam. Ind., Asian, 6th June,* 1882; *id., Pop. Nat. Hist. Mam. Ind.,* p. 503.

Vern.—Sambhar, Hindi; *Jeroo* in the Himalayas; *Meru,* Marathi; *Kadathi,* Tamil.

THE SAMBHAR.

Hair coarse, dark brown to slaty, according to season; chin yellowish, also the inside of limb and tail, and a patch on the hind quarter, the latter with more of an orange tinge; throat with long shaggy mane; ears large, bell-shaped; tail short and covered with hair.

Length.—6 to 7 feet; height at shoulder 13 to 14 hands; horns with antlers from 30 to 36 inches in length.

Hab.—Throughout India, from the extreme South to the Himalayas, ascending to a height of from 9,000 to 10,000 feet. It is found throughout Assam and Burmah and the Malay Peninsula; also in Ceylon.

According to Forsyth, this magnificent deer, a truly noble animal, is to be found wherever the Bison is procurable, but it changes its location very often to suit the season of the year, and according to the abundance or otherwise of its food. In the Central Provinces, while the crops of the table-land and lower plains are green, the herds of Sambhar come out to feed on them at night, remaining during the day near the edge of the jungle, unless driven or disturbed, when they retreat to the depths of the forest. No deer is said to be more wary than the Sambhar. It is the last to come and drink in the evening, and the first to retire into the forests in the morning. At all times, except the rutting season, which is October and November, the old stags remain mostly solitary, but they enter deeper into the forests and go higher up the hills. In the Madras Presidency it is found in many districts, affecting the hilly localities. Mr A. W. Morris says, their sense of smell is very acute, as frequently when driven towards points where guns have been posted they have suddenly broken back and given the sportsman no chance of a shot. The young, which are born about February, are generally with their mothers till June or July. The commonest method of getting at Sambhar is driving with beaters. They are also shot from off elephants. Stalking Sambhar is generally admitted to be by far the most enjoyable and sportsman-like way of killing them, but more are shot, Sterndale says, in *battues,* or over water, when they come down to drink, which is said to be only every third day.

CSL

Gen. AXIS, *Gray*.

Upper part of antlers simply forked, situated on an elongate hairy pedestal; upper tine on inner hinder edge of the beam; tres-tine longer than the posterior one; feet pits in the hind feet; groin pits present; skin spotted with white.

Axis maculatus (*Gray*), *Jerd.*, *Mam. Ind.* p. 260; *Sterndale*, *Pop. Nat. Hist.*, *Mam. Ind.*, *Asian*, 20*th June* 1882; *id.*, *Pop. Nat. Hist. Mam. Ind.* p. 506.

Vern.—*Chittul*, Hind; *Chatidah*, Bagulpora; *Dupi*, Telugu; *Pooli Mami*, Tamil.

THE SPOTTED DEER.

Head unspotted brown; muzzle dark brown; ears white within; body yellowish or rufous fawn in colour, and spotted with white, the spots forming regular lines; a dark dorsal stripe present; under parts from the chin to between the thighs, also the inner side of limbs, yellowish white,

Length.—56 to 60 inches; height at shoulder 36 to 38 inches. Horns average 30 to 36 inches.

Hab.—Throughout India, except Sind and the Punjab and east of the Bay of Bengal. It is found in Central and Southern India and in Orissa, also the Central Provinces.

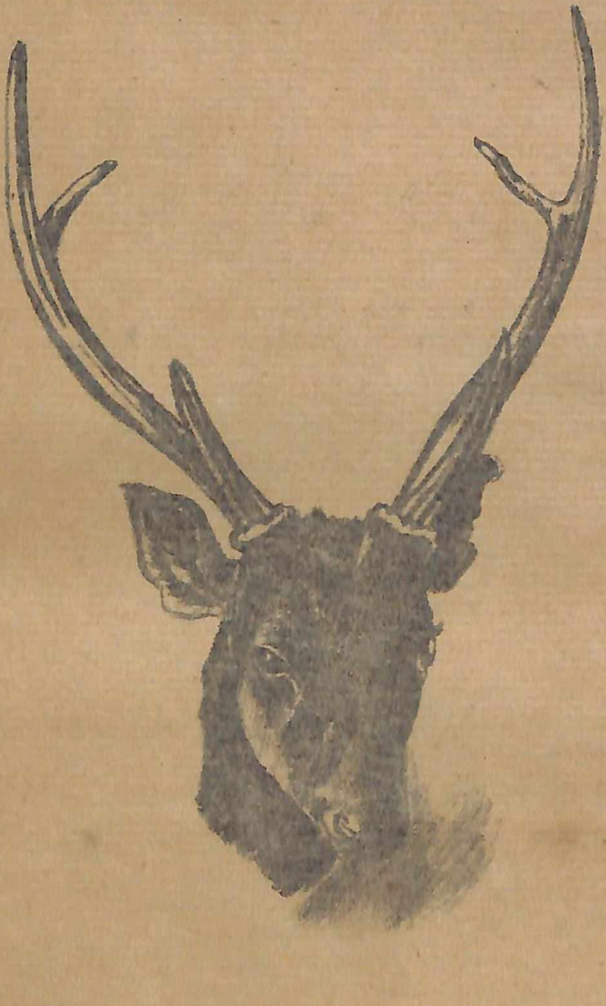
This beautiful deer is found in forests, and especially in situations where there is an abundance of water, as a stream, or jungle bordering rivers. It is gregarious and found in large herds. Often as many as 60 or 70 together, though 30 to 40 are common. Bamboo brakes they are very partial to. Sterndale says, generally Spotted Deer and lovely scenery are found together in Central India. In South India they affect nearly similar situations, and Mr. Morris says do much injury to growing crops and other cultivation. Young have been found with their mothers in the month of March. They are timid animals at best, but cases are on record where bucks have turned on their pursuers with damaging results. On being alarmed in their forest retreats, the buck is no mean foe; he holds himself proudly, when he sees the intruder, advances in little skips on tip toe, the hair on his body almost standing on end, head erect and antlers well thrown back, rushes on the sportsman either to gore him to death, or fall a victim to a gun or spear.

Axis porcinus (*Gray*), *Jerd.*, *Mam. Ind.* p. 263; *Murray*, *Hdbk. Zool.*, &*c.*, *Sind*, p. 96; *id.*, *Vert. Zool. Sind*, p. 60; *Sterndale*, *Pop. Nat. Hist. Mam. Ind.* p. 508; *Asian*, 20*th June* 1882.

Vern.—*Parah*, Hindi; *Khar-laguna*, Nepaul; *Nuthurini Hurrun*, Beng

CSL

MAMMALIAN GAME



HOG DEER

Axis Porcinus

CSL

THE HOG DEER.

General colour light chestnut or olive brown, an eye spot present; margin of lips, the tail beneath, limbs within and belly white. Young spotted with white till about the sixth month, when the spots gradually disappear. The distinction between this species and *A. maculatus* is the absence in this of the dark dorsal stripe and white patch on the haunches.

Length.—42—44 inches ;tail 8; height 2·8; horns 15—16.

Hab.—Sind, Punjab, N.-W Provinces, the Gangetic Valley, Assam, Sylhet and Burmah; also in Central India and Ceylon.

In Bengal, Jerdon says, it is abundant in many parts near the foot of the Himalayas, on Dehra Doon, and near the Ganges, Sutlej and Jumna. In Sind as elsewhere it prefers the vicinity of water, affecting open forest or grass jungle, where they lie sheltered during the day. They are generally got by being driven out by a line of beaters or by elephants. To say the least, it is very tame shooting, when considered as game. Its flesh is said to be good, and the natives are extremely happy when they fall in with the meat of this deer. The rutting season begins in September and October.

Gen. RUCERVUS.

Horns with the tres-tine and royal tine branched, the tres-tine generally much developed; no bez tine; muzzle pointed; canines in males only.

Rucervus duvaucelli (*Cuv.*), *Jerd., Mam. Ind.* p. 254; *Sterndale, Pop. Nat. Hist. Mam. Ind., Asian, July* 4, 1882; *id., Pop. Nat. Hist. Mam.* p. 510.

Vern.—Barasingha, Hindi.

THE SWAMP DEER.

General colour light or fulvous yellow or chestnut during summer. In winter still paler or yellowish brown.

Length.—44 to 46 inches; horns about 36 inches, with 12—14 points.

Hab.—The Himalayas to Bhutan; also Assam, inhabiting, as Jerdon says, the island and churs of the Brahmapootra, extending down the river in suitable spots to the eastern Sunderbunds. It is also stated to occur near Monghyr, and thence extends sparingly through the great forest tract of Central India. Sterndale says he found it in abundance in the Raigar Bichia tracts of Mundla, at one time attached to the Seonee district.

The Barasingha, like the Spotted Deer, is gregarious, and is found in herds of from 40 to 50. They affect chiefly open forest lands, or undulating grass jungles in the vicinity of water. That the horns of the Barasingha are next to those of the Markhor, the handsomest trophies that can be obtained in the splendid forests of the Himalayas, cannot be denied, "but success is neces-

CSL

sary, and to obtain this you must first ensure really severe winter, and manage to get about, then there is little doubt that some big trophies might be got; but it is said, do not come to Kashmir for stag-shooting in the winter months, rather try the early spring, be on the shooting ground by the 1st of March, and then go up the Nowborg valley and wait below the Murgan Pass, or else to Palgaum up the Liddar, or lastly, and probably the best, go to Wangut, or Goond, or below Sonamurg in the Sind valley."

From September 20th to October 15th may be said to be "the calling" or rutting season. We have heard a stag call as early as September 11th, and as late as November 10th, but this is unusual. The best plan is to select a good spot for a head-quarter's camp, and then to take on to the hillside a few days' provisions and a couple of blankets. Under the shade of any big fir tree a comfortable bivouac can quickly be arranged, and the hunter is free to follow a calling stag without troubling himself as to where he must pass the night.

When lying half-awake, half-dozing, the sportsman is often roused by a low moaning sound. This is uttered by a stag lying down, and is only heard at long intervals; the shrill call amounting almost to a whistle, is when the stag is travelling or standing under some bush or tree. Call after call then follows, and often at very short intervals of time. When this occurs in the day time, he is generally brought to bag, but more frequently the stag calls after dark or in the early morning hours. The advantage gained by sleeping on your ground is, that owing to the calling herds at night, the stag betrays his presence, and if he will only call now and again in the day time his fate is sealed. Brinkman's book treats well and ably on this subject; he mentions that it is absolutely necessary to be accompanied by some one who knows every drinking place, glade, &c.

As a general rule, choose a locality where the stags travel during their migration from the higher hills to the lower ground where the females have been passing the summer. As the month of October goes on, work your way lower down; insist on visiting every small pool of water that lies within your beat, and avoid very heavily-wooded tracts. Next comes the question—a question that has often been asked us—"How many good heads could one hope to obtain if one stayed in Kashmir during the whole calling season?" Well, it is hard to say. It is very unlikely that a fairly good sportsman would score a blank; it is still more unlikely that he would get more than three good heads, but he might possibly get six or seven pairs of antlers of sorts. Twelve-tined specimens are now rare, but there are still more splendid heads left in Kashmir. Here are the measurements of two very fine pairs of horns of Sambhar that were killed in 1879-80:—

Length of horn.	Girth above brow antler.	Divergency at tips		Where obtained.
		Greatest.	Least.	
47 inches.	7¾ inches.	56 inches.	29 inches.	Sind Valley.
46 " "	8 " "	50 " "	32 " "	Do.

CSL

The biggest stag that was measured stood at the shoulder $49\frac{1}{2}$ inches. Most stags are 48 inches or thereabouts. The winter skin is worth preserving, but it is a heavy trophy to carry about. By far the greater number of horns have only ten tines; but many have been got with twelve and even fourteen tines. Many men call the small false points "tines"; if these are counted there is no end to the number.

Rucervus eldi, *Beavan, J.A.S. Beng.* 1838. Cervus dimorpha, *Hodgs.*
Vern.—Thamin, Burm.; *Sungrai* in Munipore.

THE BROW-ANTLERED OR ELD'S DEER.

General form of *R. Duvaucelli*, but with the tres-tine greatly developed and the royal less so; brow tine long. In colour it is a light rufous brown, sometimes with faint spots on the under parts; inside of ears almost white; tail black. (*Sterndale.*)

Height.—12 to 13 hands.

Hab.—Burmah, Munipore, Eastern Himalayas, Siam and Malay Peninsula.

There is not much known of this deer. Even Sterndale does not give much information, nor can I find any record in the *Asian* in regard to sportsman's experience of it. In habits it is said "to be very wary and difficult of approach, especially the males, it is also very timid and easily startled." The males when wounded are said to charge vigorously. It is a plain loving species, and although it will frequent tolerably open tree jungle for the sake of its shade, it will never venture into dense or matted underwood. When startled, like the *Axis* it gives 3 or 4 large bounds, and afterwards settles down into a long trot, which it will keep up for six or seven miles.

A SYLLABUS OF PRACTICAL TAXIDERMY.

A KNOWLEDGE of Taxidermy is as necessary to the pioneer of science in untrodden or unexplored regions, where the rarest of objects of Natural History are perhaps to be met with, as it is to the sportsman who seeks his game in the various well-known hunting grounds, or to the naturalist who, while not being quite as ardent in his desire to stray far afield, yet moves about to collect his specimens in aid of scientific research. It is not sufficient for either of these to make a sketch of the animal he has brought to book, and to paint in water colors every shade of color of the animals in the most artistic way, and describe such in the minutest detail, but it is necessary that besides the intelligent facts which may have been recorded by him, these should be illustrated by the skins, skulls and other necessary parts in the interest of science and ultimate enhancement of his own gratification in having probably made—unconsciously or not—additions to the already existing record of the fauna of the region he was exploring; or in having brought to light the existence of an animal hitherto unknown. Once an opportunity is lost, it may never recur; and the discovery, simply for want of a little knowledge or a handy guide book, is perhaps consigned to the *limbo* of doubt for many years to come, or perhaps for ever, although *his* facts may remain recorded. It is then more than an observant faculty, more than an artistic talent, more than a naturalist's or sportsman's tastes that are wanted, and this is simply the want of a knowledge of taxidermy, or just the knowledge of how to preserve and bring home the valuable trophies got from afar, from places probably before never visited by any one.

Taxidermy properly speaking is a fine art. It does not simply mean the curing and dressing of skins of game animals, but it goes further; it means the artistic setting up of these, and of all other animals, whether mammal, bird, reptile or fish, in their life-like form; this could only be done by being acquainted with the animal in a state of nature, and so to be able to select a design to illustrate some peculiarity of its life and the surroundings of its native haunts. It is here that, besides technical skill, the taxidermist at home in his establishment needs be an artist, a field naturalist, an almost anatomist and osteologist; without this he could never re-produce the life-like form of an animal. There are few taxidermists indeed in India who have the above accomplishments, and who have studied animal life in their native fastnesses, but the existence however in the present day of zoological gardens, maintained and regulated on scientific principles, as at Calcutta, afford certain facilities for such study to only those who are naturalists professionally, and who only could really give artistic effect in the mounting or setting up of trophies. But the evil of the present day is that every "mochee" or cobbler calls himself a naturalist and taxidermist, and hence sweating salts—cured skins at less than half the established naturalist's charges are the result. Repentance comes too late in such cases, the salts cannot be extracted, the skin falls to pieces, and becomes a prey to the millions of insects which make it their home and food.

Henceforward with this Syllabus no naturalist or sportsman need suffer. My advice is eschew "mochees" or cobblers; go to professionals; pay higher charges; follow the instructions laid down here, and keep your trophies for centuries.

The apparatus or implements requisite for collecting and preserving skins of all animals, from the elephant to a mite (leaving aside the rifle and ammunition), are simple, and no haversack need carry more than the following:—

		Rs.	a.	p.		Rs.	a.	p.
2 large clasp dissecting knives	Each	3	0	0	=	6	0	0
2 small 2-blade penknives	"	1	8	0	=	3	0	0
1 pair wire cutting pliers	"	......				1	8	0
1 small ½ lb. hammer	"	......				1	8	0
1 pair large 10" scissors	"	......				2	0	0

		Rs.	a.	p.		Rs.	a.	p.
1 pair small 5″ scissors	Each	......				1	8	0
1 pair small 4″ ,,	,,	......				1	0	0
1 lb. Powdered chalk, gypsum or whiting	,,	......				0	8	0
2 Shoemaker's awls	,,	0	8	0	=	1	0	0
2 ,, ½ moon knife	,,	1	0	0	=	2	0	0
2 ,, ½ do. saw-edged scrapers	,,	1	4	0	=	2	8	0
1 dozen stout sewing needles	,,	0	0	3	=	0	3	0
1 Iron brain scoop for large game	,,	......				1	0	0
1 Brass do. do. birds	,,	......				0	12	0
½ dozen balls bookbinders' sewing twine	,,	0	8	0	=	3	0	0
½ dozen penholders like gouges for stuffing	,,	0	0	6	=	0	3	0
Dealwood collecting boxes for insects	,,	1	4	0	to	2	8	0
Japanned tin collecting boxes for the shoulder	,,	......				6	0	0
Cork sheets for setting-out, per dozen	,,	......				3	12	0
Insect cases, papered and corked, with glass frame polished mahogany, 4-8 to 6-0	,,	......				6	0	0
Killing bottles	,,	......				2	8	0
Folding wire net, 4-8 to 6-0	,,	......				6	0	0
Folding wire hoop for net	,,	......				3	0	0
Setting boards of sizes, 1-0 to 3-12	,,	......				3	12	0
Pill boxes for insects, per dozen, of sizes	,,	......				1	4	0
Entomological pins, per gross, of sizes	,,	......				3	0	0

The above can be had at the Victoria Natural History Institute, Ripon Road, Byculla, Bombay.

With the above requisites, a collector in any branch of Natural History may be said to be quite fitted out, whether sportsman or naturalist,—gun and preservatives excepted—the latter being used as occasion may demand or require; the methods of preserving being more than one. These will be detailed further on.

It is essential however, when a specimen is secured, whether of a mammal or a bird, that a note should be made of the following:—1, Colour of the pupil and irides. 2, Colour of the muzzle, muffle, or in the case of a bird, bill, eyes and legs. 3, Colour of the horns. 4. Native name of the animal. 5, Sex. To sex a bird. After skinning cut through the loins, and examine the inside; if ovaries are present it is a female; otherwise a male.

SKINNING LARGE QUADRUPEDS.

This is still done as in the old honored time. Lay the animal on its back with its head from you. Plug up the nostrils with cotton, wool or tow, or any material which would serve the purpose; put some down its throat also, so that nothing may ooze from these parts to soil the skin in the skinning operation. Make an incision from under the chin, along the medial line of the belly to the extremity of the tail ; next make lateral incisions between the fore and hind legs, on the inner side, straight up to the heel and paws. These lateral incisions leave the skin in tongue pieces. Always make it a point not to cut too deep, or the skinning operation will become a tedious task. Next, begin from the breast and raise the skin with the thumb and forefinger and detach the skin round the forelegs ; and at the last joint where the paw is, find the joint and cut it away, this will complete the skinning of the forelegs ; having got thus far, detach the skin from along the chin, throat, neck and belly, skinning the latter as far as possible down the spine ; cut round the under lip from as close to the jaw bone as is possible, and having detached it, turn it over the forehead of the animal ; continue skinning the upper lip in the same way as the lower, and cut the tender nasal bones close to the skull ; then skin up the face till you reach the eyes. Be very careful in detaching the rim of these organs from the skull ; next, the ears, should also be detached from close to the skull.

At this point the head may be said to be skinned Now keep on detaching the skin from the back of the head and neck and down the back till that part is reached where the lateral incisions were made between the hind legs; proceed detaching the skin from the hind legs, in the same manner as was done with the forelegs, cut at last joint of foot of each leg, and then proceed skinning the haunches and tail. This system will of course do where the skin is not required for "setting up," and is only required for rugs, &c. When a skin is required to be "set up" entire, the last metatarsal and metacarpal bones *should*, after having been divested of all flesh and cartilage, be kept in, and the separation of the legs must be made at their upper joints or knees and elbow, and not as for skins for rugs at the joint of the paw ; and in every case, whether a horned animal or not, the incision should begin from some little distance behind the chin. In the case of horned animals the head should be skinned to the very roots of the horns all round and on both sides, and the skull should not be separated from the skin by cutting round the roots ; and as in the case of animals without horns, as of the Feline tribe, &c., the skull with the flesh should be severed from the trunk, divested of every particle of flesh with a knife ; the brains and eyes scooped out, and the skull well washed. This done, any preservative preparation which may be at hand should be applied both to the outside and inside of the skull. When an opportunity is found the skull should be left to macerate in tepid water, to take away any particles of flesh which may be left adhering to it.

The *foramen magnum* (or the hole through which the brain has been scooped) should not be enlarged, or cut in any way. If this is done the scientific value of the skull is lost. The above remarks in regard to the cleaning of the skull apply also to horned animals, but, in the latter case, the skin being attached to the skull at the base of the horns, care should be exercised that the skin is not wetted.

Where small animals are to be operated on, as Foxes, Jackals and Wolves, there is no need for making lateral incisions between the fore and hind-legs. These could easily be pushed out and severed from the joints at the shoulders and thighs, and skinned down or drawn out to the toes.

PRESERVING, CURING AND DRESSING SKINS.

There is more than one method of preserving skins of Mammalian Game, and the preservatives to be used depend upon the ultimate design of the sportsman, whether he intends the skins of his game to be converted into rugs or for "setting up."

For preserving skins of large game in the field, the sportsman should supply himself with Murray's (the author's) Parmoline and Parmoline Paste, two of the most effectual compounds known for this purpose, surpassing all the present arsenical and earthy salts preparations and wood ash. The prices of these new preparations are extremely moderate,* and the directions so simple that the veriest tyro could cure a skin with them.

The animal having been skinned, stretch out the skin, and with a rough brick, pumice or any other stone or rough material, rub the Parmoline compound thoroughly into the skin *across* its length. All fleshy parts, as the lips and feet, should be thickly sprinkled with it, and if practicable "forked" in; then dry in the open air, or roll up till time is found for drying. Two applications only of this compound are necessary, *viz.*, on the 1st and 3rd day. For a Tiger, Leopard, Bear or Antelope skin from 5 to 6 lbs. would be required at each operation; Bison, Nylghai, Sambhar 8 to 10 lbs. The secret of success with this, or the paste, or with any other preservative, even the ordinary alum and saltpetre or wood ashes, when Parmoline is not at hand, is the breaking up of the fibres, &c., of the pelt running along the length of the skin, and allowing the preservative to penetrate the skin through the flesh side. Failures would then be unknown, but NEVER USE ONE GRAIN OF SALT.

The salts of alum and saltpetre can be easily extracted, but of common salt not without some labour and expense. A bottle or two of *spirits* of turpentine should be always at hand to apply to the lips and feet, to ensure the quick drying of these parts and preserving them from insects.

DRESSING SKINS.

If Parmoline has been used for curing the skin in the first instance, immerse the skin in a tub of cold water for a few hours—say from 1 to 2 hours, according to the dryness of the skin,—till it has become quite soft. Then with a shoemaker's half-moon knife shave off as much of the flesh from the fleshy side of the skin, and especially of the lips, feet, and foreback; and

---

* Parmoline, 1 lb. tin, annas 12; in bulk, above 10 lbs., annas 10 per lb. Parmoline Paste, 1 lb. tin, 14 annas; in bulk, above 10 lbs., 12 annas per lb

GSL

when this has been done, rub into the skin about 3 lbs. of Parmoline with a rough brick, and immerse it in a tub containing sufficient buttermilk to cover the skin, and in which has been previously dissolved about 5 lbs. of Parmoline. The skin should now remain in this mixture for fully 36 hours, after which it should be well trampled in the tub for at least fifteen minutes, and then taken out and another course of shaving the flesh from the fleshy side should be gone through, another 2 lbs. of Parmoline rubbed into the skin, and a second immersion in the buttermilk mixture, this time for 48 hours. On the 4th day the same fleshing operation, with 2 lbs. of Parmoline rubbed in. The skin should now be left in the tub for 7 days, but should be trampled every morning both to soften the skin and to allow penetration of the Parmoline into the pelt. After this the curing operation is complete, which is generally in 10 days in warm weather and 14 in winter. The dressing of the skin is the next operation, and this, though extremely simple, requires "elbow grease." Make a thick mixture of a sufficiency of buttermilk and powdered chalk; place the skin in the sun (flesh side uppermost) and rub the mixture all over the skin. When the skin has dried, tie it in as small a bundle as possible, and beat with heavy sticks; the softer it gets by this operation, tie the bundle smaller, till the skin has become supple. The next operation is to open the bundle, and with a half moon saw-toothed scraper break up the fibres cross-wise, shaving off everything that comes up, till every part is so treated and the skin presents a smooth appearance and has become glove-soft. The dressing of the flesh side is now complete, except that a rubbing of Pumice stone and sand paper is required to smoothen it. Turn the skin on the flesh side—brush the fur well and with a warm glove rub the fur till it has got a good gloss. The process described has to be followed even when the preservatives employed are earthy salts and saltpetre. The quantity required of these last is for each Tiger skin, calculating fleshing days, about 30 lbs. alum, 7 lbs. saltpetre, and 50 lbs. buttermilk; but the earthy salts solution in the buttermilk should be changed two days previous to the skin being taken out for final dressing, else there will always be a peculiar "musty" smell about it, which is said to be bacterial and injurious to the lungs in confined rooms. Skins cured with this preparation will seldom keep above 5 or 6 years. A more effectual mixture is, in the absence of Parmoline, the addition of *burnt** instead of raw alum 20 lbs., Boracic acid 2 oz., saltpetre 6 lbs. In this mixture as many as five skins may be placed, whether of Tiger, Deer or Leopard, provided that, after following the instructions before given for fleshing and curing, 6 lbs. of burnt alum is added for each skin, and there is added a sufficient quantity of buttermilk to cover the skins. If Parmoline is used, 4 lbs. would require to be added for each skin. The number of days required for "tubbing" each skin from the day the fleshing operation is begun is, during the hot months, Tiger 10 days, Leopard 8, Bear, Nylghai, Bison and Sambhar 14 days, Jackals, Foxes, &c., 6 days. During winter the operation takes about 4 days more in each case. When in the tub the skins should be well trampled every morning for about a quarter of an hour. Small skins should be well rubbed with the hand.

---

* At the V. N. H. Inst. annas 6 per lb.; fluctuates to 8 annas.

SETTING UP OF TROPHIES OR MOUNTING MAMMALS GENERALLY.

This, as I have before said, is an art of itself. The animal having been skinned, as instructed on page 75, with the metacarpal and metatarsal bones left in, the whole skin, skull and bones should be well anointed with Parmoline* paste, or such preservative as may be at hand at the time. Arsenical soap† has been hitherto commonly used, and there are many who "stick" by it; but if this preparation has not been properly made and mixed with equal quantities of soap, arsenic powder and other necessary ingredients, there is no guarantee that the skin will not be attacked by insects within a month and the fur found to be falling off.

In mounting large quadrupeds, after the preliminary of applying the necessary preservatives, a body has to be formed or modelled, upon which the skin has to be mounted. To form this body, first take a plank of sufficient width and thickness, and place upon it the skin folded flat, representing the animal, with the two fore and two hind feet placed together. Upon this board mark the form of the animal with the proper curves of the back and haunches and the depth of the abdomen. This done, cut the board (according to the form delineated on the board in chalk) with a saw, and chisel till the outline has been satisfactorily got. The next thing is to make supports for the body. Take four iron rods of sufficient length and thickness. These rods should be fixed into the board which has been chiselled out for the model, and set in from one side, turned back on the other and clamped, so as not to move. Four legs have now been formed. Another rod should be fixed as the tail-bearer, and two others of sufficient length to carry the weight of the head and neck. These wires of the head and neck should be fixed on both sides of the jaw, on the inner side. This is exactly the system followed by "Ward"; but, in addition to this, at the Victoria Natural History Institute we reduce the weight of tow by nailing on a piece of narrow board on the sides of the body with the necessary indentations required. These are fixed on both sides, and the whole body is then wrapped with tow, modelled with modelling clay in those parts which require "setting," and the whole body then wrapped with dungaree or canvas. Before placing the skin on the modelled form, the head and neck should be first modelled, formed and mounted on the projecting wires and board to form these parts. This completes

---

* Annas 14 per 1-lb. tin at the V. N. H. Institute.

† Rupee 1 per 1-lb. tin.

GSL

the forming of the model, which should now be placed on a stand and the whole skin placed on it, stitched, and in the proper indented surfaces "tacked in" and the legs also sewn after the proper shape of thighs and shoulder bones have been made. Where the bones of the limbs are absent, it is very necessary to carve these in soft wood and put the wires through them.

In mounting head trophies, the skin should be shaved on the flesh side, but not so as to stretch it; a neck support should be made of wood, to which the skull is to be attached; the head should be moulded on the skull, and the skin brought over and sewn on the whole. The setting of the eyes is the most important, for if there is even the slightest tendency of the pupil o the right or left of one eye, the whole form appears distorted. The earst must be manipulated into shape while they are dry, by cones of stiff paper. When this is completed, a shield, of any shape preferred, should next be made, to which the neck support is fixed by screws.

In mounting small mammals, as foxes, mongoose, &c., wires of sufficient thickness are used, instead of a board, for modelling the body. The entire operation is otherwise as in mounting the larger species.

Birds.—The skinning of birds requires more care and patience than that of mammals. The first care is not to soil the feathers, and the next to keep intact the wing and tarsal bones. Precaution, in the first instance, is the "plugging" up of the throat through the mouth with cotton, also the nostrils, so that blood or mucus matter may not ooze. The bird is then laid on a table, the head away from the operator. The feathers of the abdomen along the breast-bone are turned on each side or divided, with the fingers (or forceps in the case of small birds), and an incision is made along the sternum or breast-bone to nearly the vent. A little powdered chalk or whiting is put along this incision to prevent the feathers being soiled by moisture. Next, with the thumb and forefinger, or a pair of forceps in small birds, the skin along the incision is taken up, and a gouge, or penholder-like stick, is slowly worked right down the back and round the breast and vent. Chalk or whiting cannot be used too freely as the skin is being detached. The skin of the bird having now been detached all round, the next operation is to force back the neck up to the incision on the breast-bone, put a piece of stick under it, as well as the gullet, and with one cut of a scissor separate it from the body. Leave the head and neck to themselves for a while. Next turn the breast portion of the skin gently over the shoulders, bring it down to below the armpit, and with a scissor under this latter cut away the wing-bones on each side close to the body. Leave these alone for a time. Continue stripping its coat down the back till the legs are reached. Here cut the thigh bones and proceed further to the tail up to that point commonly called the "Duke's nose" (the oil glands), and work round the vent till the base of the tail feathers is reached. Here cut the body off, and the whole bird is stripped of its coat. Now begin with the head: hold the neck where it has been cut off; turn back the skin to right over the head; then cut the neck off at the *foramen* magnum or brain-hole; scoop out the brains and eyes; cut away the tongue from the under mandible and scrape away all flesh; apply preservatives inside and outside the skull, and with a little carbolic acid on cotton anoint the fleshy parts at the base of the under mandible. Put a little cotton in the eye-sockets; anoint the skin with preservatives and turn back the whole over the head. Next deal with the wings: skin these back to the last joint of the ulna, divest them of all flesh, pushing back with the thumb-nail (or a scalpel in the case of large birds) the feathers which adhere to the ulna; cut away the first bone or humerus at the joint with the ulna and radius (the forearm), and remove also the radius; then anoint the turned-out skin plentifully with preservative, also the ulna; wrap this last with tow or cotton to the extent of its former dimensions; tie the forepart of the bone with about five inches of cotton thread or twine, and turn back the skin over the arm. This should be done with both wings, and, when finished, the two pieces of twine or thread should be tied together, about the distance it would have laid on the bird in the flesh. Next treat with the legs: the thigh, or tibia, should be divested of all flesh up to its junction with the metatarsus. This should also be well anointed with preservative, also the skin, the flesh replaced by cotton or tow, and the skin turned over. In large birds there is a thick, strong, muscular tendon behind the metacarpus or leg: this should be removed by cutting the tendon at the upper part and below the foot, and drawing it out, or by making an incision behind, and replacing it with cotton or tow cord. If this is not done, putrefaction is likely to set in, notwithstanding turpentine spirits, and the scales of the forepart to fall off. The last thing to be done is to cut away the fleshy parts of the inside of the tail and to anoint it plentifully with preservative.

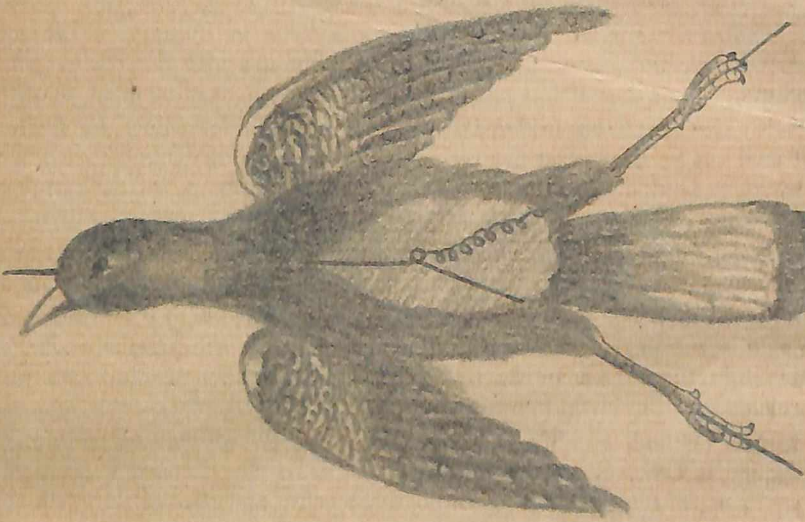
It must be mentioned here that some birds, as ducks, parrots, flamingoes, &c., owing to their enormous heads, cannot have the skin drawn over to the bill in the ordinary way. In these a small incision should be made under the chin, and the head turned out through it. The operation of skinning being now completed, the next consideration is whether the bird is intended as a cabinet or reference specimen, or to be "set up" in life-like form. As a cabinet specimen it is presumed the bird has been measured, or the following particulars have been noted before the bird was skinned:—

Sex; total length (tip of bill to tip of tail); length of wing; expanse of wing; length of tarsus; length of bill; colour of irides, also of bill, legs and feet.

Most naturalists, first, to obviate the risk of the neck breaking off, and next to give the bird its proper length as measured, insert a piece of stick of sufficient thickness from under the lower mandible to the tail, then fill the neck and body with cotton or chopped tow and stitch it, a label with all the particulars noted being lastly attached to the feet.

CSL

To mount or set up birds, whether dry skins, which should be moistened, or fresh skins, it is necessary to form a skeleton of wire; one wire to pass from the head, with two loops about the centre and through one leg, and the other passing from the other leg to the body which should be linked and twisted with the loops of the first wire ; a third wire goes from the loop to support the tail ; the whole mechanism being in the form of the accompanying sketch :—



The neck, body and thighs being all properly stuffed to the natural size, and the wing-bones tied to their proper setting length, all that remains to be done is to sew up the incision in the abdomen, smoothen down the ruffled feathers, and place the bird, with the leg wires put through two pierced holes in a board. A band round the neck, another round the breast, and a third round the wings to set these parts, complete the operation of mounting, taking for granted that the eyes have been already set into the head and the attitude required given to the bird.

Generally, dry stuffed skins which will not bear much handling are set up by being damped and having an incision made under the wings, the stuffing material taken out and the wings and tail pulled off. These parts are then wired, and the wires pushed through and fastened to a modelled body of tow, each wire being separately attached from the incision under the wing. This method is equally as good as that before described for fresh skins. With the instructions here given, a little practice will enable anybody to prepare and mount a fox or a bird in a few hours.

REPTILES.

This section embraces the turtles and tortoises; also lizards from the Crocodile to the small wall Gecko; besides snakes and frogs.

Sea turtles and fresh water tortoises are best cleaned and cured by separating the carapace from the plastron (upper from the lower shell) by cutting round the plates on the sides and the soft skin of the fore and hind limbs. This done, the contents are readily got at and cleaned out. The limbs and head are divested of flesh in the usual way by longitudinal incisions.

The mounting or setting up of these is not difficult, the different parts making almost one whole. Land tortoises having no soft shield or plates, and the plastron being hard, it cannot be separated from the carapace. To clean the flesh from these animals, the incisions should be made round the hind limbs and tail and the flesh scooped out. All small species are preservable in methylated spirits.

Crocodiles.—These, if required for mounting, should be cut along the medial line of the abdomen. The animal having scarcely any form, only needs stuffing. The large scales on the back as well as the shields on the back of turtles and tortoises should be polished with an agate pencil. Sand paper and tripoli, scratch the thin plates, and recourse must then be had to varnishes.

Snakes.—These are always best preserved in strong spirit. When this is not at hand, a solution of common salt, with saltpetre, and any liquor as brandy, gin or whisky, or country spirit 56 °/o over proof, in the proportion of one-fourth, will keep specimens, large or small, for a few months. An incision or two should however be made in the abdomen, to allow the preservative to penetrate the viscera. Methylated spirit is however best for preserving snakes. Large species, as the Boa, may be skinned, by cutting under the throat and first skinning out the head. The whole of the skin can then be drawn out like a glove. The skin should not be "pulled," but pressed back or loosened with a blunt knife. All small lizards and frogs are best preserved in methylated spirits.

Fish.—Small species are best preserved in spirit; an incision only is required at the vent to permit of the spirit penetrating the viscera. Large species are skinned and mounted. When a fish is required whole, the incision must be made along the least important side from the gill to the base of the tail. The skinning operation should be very carefully done. Before beginning, the best side should be covered with thin tissue or silver paper to prevent any scales falling off. Lay the fish on a board with that side uppermost which is not required to be shown. Cut it along the medial line with a good pair of scissors, and in skinning every precaution should be taken that the scales on this side also do not come off. After skinning the fish up to the fins, dip the scissors below the rays of the dorsal fin or fins and cut them

GSL

away. The same should be done with the lower fins, and, lastly, at the junction of the vertebral bone with the tail and head. Take up the tail end and gently skin from below it, slightly pulling up the vertebral column. Once fairly under this part, the other side of the fish is soon skinned, but care should be exercised that the silvery lining next to the scales is not scraped off, as it is this lining which, in the first place, keeps the scales together, and, next, to a great extent preserves the natural colours for a considerable time. The next operation is to extract the gills and the eyes, and with a crooked probe the fatty flesh from the sides of the head, which must afterwards be replaced with cotton or tow. Having completed this, wash the whole fish in *tepid* water to remove all mucus, grease, &c., re-paper the good side and begin to stuff after application of preservatives. I have always found it best, till the specimen has dried, to coat it with *spirits* of turpentine daily. I never use varnish, which, in the course of a month, soon discolours the whole specimen yellow.

The fins should, before the application of the spirits of turpentine, be damped and put out as natural as possible on a piece of board or cardboard.

Often it is not possible to obtain spirit of wine, when stock runs out. In its stead an equally efficacious preservative for fish and reptiles is what is known as Goadby's Solution.

Take—

Common Salt	4 oz.	Well mixed and the solution filtered.
Alum	2 oz.	
Corrosive Sublimate...	4 grains.	
Boiling water	2 quarts.	

Another method is to cut away the whole of the worst side of the fish from about $\frac{1}{4}$ or $\frac{1}{2}$ inch below the fins and head. Clean out all the flesh as before, apply preservative and stuff. This method involves the mounting of the specimen on a board with the fins pinned out and their bases pinned or tacked into the board. In preserving fish or reptiles in spirit, the spirit should be changed after ten days. If they are to be sent away, each should be separately wrapped in a piece of linen and packed as occasion may require; but an incision should always be made in the anus and the entrails taken out, to allow the spirit to penetrate the side from the gill to the base of the tail.

Crustacea.—These are also best preserved in spirit; but, in the first instance, the spirit should be one-half or one-third water, else the carapace loses its colour and becomes red. Stronger spirit may be used one week after. Dried specimens have their carapace or upper back separated, the flesh extracted, and, in the case of large-clawed specimens, a hole made on the under side, as much flesh as possible extracted, and, with preservative applied inside, allowed to dry, with the legs placed in a natural position.

CSL

MOLLUSCS.

On Collecting and Preserving Molluscs.

The circumstances under which shells are found are various, and in this treatise only such will be treated of as are collected by the hand and dredge.

Land shells are had in abundance in warm and moist localities, and in India chiefly during the rains, if required alive, and also under plants in pots; freshwater shells in rivers, weedy tanks and marshes. There are very many species in India which may be said to be arboreal in their habits. Many species remain dormant for long periods, and even after collection no attention need be paid to them.

For collecting freshwater shells, small-meshed nets, which should be made of some strong material, is necessary, as probably the strength of the weeds, under which many species live, would be liable to break the net. Here the *Melaniadæ* are abundant, and the more minute species of Bulini. It must be mentioned that in cleaning these the operculum must always be preserved.

These may be killed by being thrown into boiling water,—*Not boiled in water;* and the best expedient for removing the animal is a long strong pin. The same process may be adopted with freshwater or marine bivalves till their shells gape, when the animal can then be removed; but in a genus like the *Anatina* provided with an *ossicle*, care should be taken that the ligament or hinge is not injured.

For deep-sea mollusc fishing either a trawling or a towing net would be necessary. The dredge and lines should be made strong enough to pull over any resistance below. In all cases boiling should be resorted to for the larger molluscs, as whelks, &c., for cleaning the shells and freeing them from the animal.

Sea shells, Algæ, Echini, and star fish generally are collected by wading among the rocks and pools near the shore when the tide is at its lowest. All loose stones should be turned over and every overhanging rock examined thoroughly below as far as a gloved hand would reach, and should the rock be deeper, a useful implement would be a long iron rake with close set teeth and a small mesh net underneath. Chitons are got by placing a sharp spatula or knife under them quickly and turning them over; the same remarks apply to limpets. The first should be killed by being kept under two weighted boards or there is a tendency to their rolling up in hedgehog fashion. Then there are bivalves which bury themselves in mud at very low water. These should be dug out with a spade or fork. Those boring in stones should be got out by means of the hammer.

All seaweed which may be collected should be closely examined for minute species, or if plunged in tepid water, they will all appear on the surface or fall to the bottom.

20885

Under Most Distinguished Patronage.

THE VICTORIA NATURAL HISTORY INSTITUT

RIPON ROAD, BYCULLA, BOMBAY,

With its Staff of Scientific Naturalists and Practical Taxidermists, undertakes the curin dressing of skins and mounting of heads (as trophies) of both large and small Game; al curing and mounting of Birds, Reptiles and Fish at the following charges :—

Skins of Birds, Fish and Reptiles cured flat—Annas 8 per foot of length or less. M in best attitude—Re. 1 per foot of length or less. Crocodiles mounted Rs. 5 per foot o curing same, Rs. 1-8 per foot.

Skins of Large and Small Game Mammalia cured flat, supple and glove-soft, per length—Annas 12. Lining and Mounting on cloth with colored broadcloth scolloped border— 5 per foot of length of border. Mounting heads of Horned Animals—Rs. 4 per foot of Other animals, as Tigers, Bears, Leopards, &c.—Rs. 6 per foot of length. Bison, Buffa Nylghai—Rs. 7 per foot of length. Elephants' feet, tusks and skins converted into various ornamental articles, as footstools, candelabra, Flower Vases, Work Boxes, Liqueur Stan Young Crocodiles converted into Cardtrays, Cigar Stands, &c.; Boars' tusks and hoofs of mounted to any designs in Silver, &c.

Always in Stock.—Skins of Mammalia generally, with and without Skulls, for Deale Museums; also collections of *named* Indian Birds' Skins, Birds' Eggs, Reptiles, Fish, Cru Insects generally, Sponges, Zoophytes, Seaweeds, &c.

Naturalists' Requisites in every department supplied; also *Live Animals at notice.* Indian Drugs and Raw Products supplied and exported. Analysis of Minerals and Waters undertaken.

Terms: One-half of approximate cost in advance with order for fr and other charges.

Chief Office—Ripon Road, Byculla, Bombay, James A. Murray, F.S.A.L., &c., Man

Branch for the Punjab, N.-W. Provinces and Central India—Lionel Carton, Superintendent, Umballa.

Branch at Jhansi—H. P. Floyd, Superintendent.

Agent for Bengal—Fred. W. May, "The Stores," Calcutta.

Directing Manager for South India—T. Misquita, Office, 2/167 Mount Road, Madras.

Branch at Madras, 2/167 Mount Road, Madras, C. V. Subrahmanyam Iyer, Superintende

FOR SALE.

Murray's "Edible and Game Birds of British India and Ceyl

Fully illustrated. Price Cash with order Rs. 5-8, including Postage.

Murray's "Mammalian Game of British India."

Illustrated. Cash with order Rs. 8.

Murray's "Avifauna of British India and its Dependenci

With coloured and plain Lithographs, and numerous woodcuts, 2 vols. Rs. 3

		Rs.	
Murray's Syllabus of Practical Taxidermy		0	1
Murray's Labels for Birds and Birds' Eggs, according to his Avifauna of British India		12	0
Murray's Avifauna of Ceylon	Illustrated	10	0
" Vertebrate Zoology of Sind	"	8	0
" Plants and Drugs of Sind		5	0